

THE GENERAL BOARD  
United States Forces, European Theater

May - 10  
S - TNAH  
ETO - G I  
10

4A  
25  
4586  
286

ORGANIZATION, EQUIPMENT AND TACTICAL EMPLOYMENT

OF

THE INFANTRY DIVISION

MISSION: Prepare detailed report and recommendations on the organization, equipment and tactical employment of the Infantry Division.

The General Board was established by General Order 128, Headquarters, European Theater of Operations, U. S. Army, dated 17 June 1945, as amended by General Order 182, dated 7 August 1945 and General Order 312, dated 20 November 1945, Headquarters, United States Forces, European Theater, to prepare a factual analysis of the strategy, tactics, and administration employed by the United States Forces in the European Theater.

File: 320,2/9

Property of  
Library of the Chief  
Military Assistant  
General Reference Division

Study Number 15

THE GENERAL BOARD  
UNITED STATES FORCES, EUROPEAN THEATER

TABLE OF CONTENTS

<u>SUBJECT</u>	<u>PAGE</u>
SECTION 1: INTRODUCTION.....	1
SECTION 2: DISCUSSION.....	2
GENERAL.....	2
ORGANIZATION AND EQUIPMENT.....	2
Division Headquarters.....	2
Special Troops.....	2
Infantry Regiment.....	4
Division Artillery.....	9
Anti-Aircraft Artillery.....	10
Tank Regiment.....	10
Cavalry Reconnaissance Troop (Squadron).....	11
Engineer Battalion (Regiment).....	11
Medical Battalion.....	12
Reinforcement (Replacement) Battalion (Cadre).....	12
TACTICAL EMPLOYMENT.....	12
SECTION 3: CONCLUSIONS.....	15
SECTION 4: RECOMMENDATIONS.....	16
BIBLIOGRAPHY.....	17
APPENDICES:	
Appendix 1 - Directive	
Appendix 2 - Chart, The Inf Div	
Appendix 3 - Chart, Sp Trps	
Appendix 4 - Chart, Inf Regt	
Appendix 5 - Chart, Div Arty	
Appendix 6 - Chart, 105mm How Bn	
Appendix 7 - Chart, 155mm How Bn	
Appendix 8 - Chart, AAA Bn	
Appendix 9 - Chart, Tk Regt	
Appendix 10 - Chart, Rcn Sqd	
Appendix 11 - Chart, Engr Regt	
Appendix 12 - Chart, Med Bn	
Appendix 13 - Summary of Questionnaires	
Appendix 14 - Ltr, Hq, The Genl Board, USFET, APO 408, dated 31 Oct 45, subj: "AAA with the Inf Div" with 2 Incls	
Appendix 15 - Conference on the Inf Div, Bad Nauheim, Germany, 20 Nov 45	

THE GENERAL BOARD  
UNITED STATES FORCES, EUROPEAN THEATER  
APO 408

REPORT ON THE INFANTRY DIVISION

Prepared By:

Brigadier General A.F. Kibler, O-6668, Assistant Chief of Staff, G-3  
Brigadier General H.N. Hartness, O-12269, G-3 Section  
Colonel S.G. Conley, O-15707, G-3 Section  
Colonel D.J. Bailey, O-16174, Anti-Aircraft Artillery Section  
Colonel T.A. Broom, O-18246, Quartermaster Section  
Colonel H.H. Critz, O-19786, Artillery Section  
Colonel O.F. Kotick, O-220996, G-1 Section  
Colonel E.J. Peterson, O-15523, Engineer Section  
Colonel R.G. Stilwell, O-21065, G-3 Section  
Lieutenant Colonel E.G. Bevan, O-441090, Ordnance Section  
Lieutenant Colonel F.H. Cantrell, O-25295, G-3 Section  
Lieutenant Colonel W.R. Cheves, O-362598, G-3 Section  
Lieutenant Colonel J.K. Damon, O-365468, G-4 Section  
Lieutenant Colonel L.M. de Riemer, O-17640, G-3 Section  
Lieutenant Colonel S.G. Fries, O-19827, Armored Section  
Lieutenant Colonel R.T. Nelson, O-17308, Signal Section  
Lieutenant Colonel H.B. St. Clair, O-22017, G-2 Section  
Lieutenant Colonel E.J. Whiteley, O-24627, Medical Section  
Captain R.R. Duddy, O-1285723, Provost Marshal Section

Principal Consultants:

General G.S. Patton, Jr., O-2605  
Lieutenant General G. Keyes, O-3561  
Major General L.C. Allen, O-4760  
Major General C. Andrus, O-3266  
Major General A.J. Barnett, O-5364  
Major General A.R. Bolling, O-7548  
Major General J.E. Dahlquist, O-7120  
Major General H.L. Earnest, O-7282  
Major General R.W. Grow, O-4621  
Major General F.A. Keating, O-5360  
Major General R.C. Macon, O-4733  
Major General H.L. McBride, O-4430  
Major General W.S. Paul, O-5616  
Major General F.B. Prickett, O-4458  
Major General W.M. Robertson, O-3378  
Major General W.R. Schmidt, O-3573  
Brigadier General C.H. Armstrong, O-5318  
Brigadier General J.D. Balmer, O-11389  
Brigadier General G.H. Davidson, O-16755  
Brigadier General J.S. Guthrie, O-18228  
Brigadier General J.A. Holly, O-12360  
Brigadier General O.S. Rolfe, O-8637  
Brigadier General A.C. Tychsen, O-8256  
Brigadier General L.H. Watson, O-3896  
Colonel R.N. Hagerty, O-7618, Infantry  
Colonel J.A. Heintges, O-20281, Infantry  
Colonel J.C. Macdonald, O-8402, Cavalry  
Colonel E.H. McDaniel, O-16497, Infantry  
Colonel L.C. McGarr, O-17225, Infantry  
Colonel J.G. Van Houten, O-16669, Infantry

THE GENERAL BOARD  
UNITED STATES FORCES, EUROPEAN THEATER  
APO 408

LIST OF COMBAT OFFICERS QUESTIONED

Lieutenant General W. H. Haislip, O-3374  
Commanding General, XV Corps

Major General R. R. Allen, O-4652  
Commanding General, 1st Armored Division

Major General C. Andrus, O-3266  
Commanding General, 1st Infantry Division

Major General A. J. Barnett, O-5364  
Commanding General, 94th Infantry Division

Major General A. R. Bolling, O-7548  
Commanding General, 84th Infantry Division

Major General J. E. Dahlquist, O-7120  
Commanding General, 36th Infantry Division

Major General H. L. Earnest, O-7282  
Commanding General, 90th Infantry Division

Major General C. H. Gerhardt, O-5259  
Commanding General, 29th Infantry Division

Major General R. W. Grow, O-4621  
Commanding General, 3d Armored Division

Major General C. R. Huebner, O-4552  
Commanding General, 1st Infantry Division

Major General F. A. Keating, O-5360  
Commanding General, 102d Infantry Division

Major General R. C. Macon, O-4733  
Commanding General, 83d Infantry Division

Major General H. L. McBride, O-4430  
Commanding General, XX Corps

Major General E. P. Parker, Jr., O-3457  
Commanding General, XXIII Corps

Major General W. S. Paul, O-5616  
Commanding General, 26th Infantry Division

Major General F. B. Prickett, O-4458  
Commanding General, 4th Armored Division

Major General S. E. Reinhart, O-4421  
Commanding General, 26th Infantry Division

Major General W. M. Robertson, O-3378  
Commanding General, XV Corps

Major General W. R. Schmidt, O-3573  
Commanding General, 3d Infantry Division

Brigadier General C. M. Busbee, O-3794  
Commanding General, Division Artillery  
102d Infantry Division

Brigadier General F. Camm, O-9902  
Commanding General, Division Artillery  
78th Infantry Division

Brigadier General J. S. Guthrie, O-18228  
G-3, Seventh U. S. Army

Brigadier General W. A. Holbrook, Jr., O-12177  
Commanding General, 12th Armored Division

Brigadier General O. S. Rolfe, O-8637  
Commanding General, 71st Infantry Division

Brigadier General A. G. Tychsen, O-8256  
Commanding General, 100th Infantry Division

Brigadier General R. Van Brunt, O-16225  
Chief of Staff, XXIII Corps

Brigadier General L. H. Watson, O-3896  
Commanding General, 79th Infantry Division

THE GENERAL BOARD  
UNITED STATES FORCES, EUROPEAN THEATER  
APO 408

LIST OF COMBAT OFFICERS QUESTIONED

Colonel L. N. Buck, O-17657  
G-3, XXI Corps

Colonel E. B. Crabill, O-6769  
Assistant Division Commander, 83d Infantry  
Division

Colonel M. J. Dugas, O-19582  
Headquarters XV Corps

Colonel H. D. Edson, O-19541  
Commanding Officer, 15th Infantry Regiment,  
3d Infantry Division

Colonel F. C. Feil, O-285578  
Headquarters 9th Infantry Division

Colonel J. A. Gloriod, O-19793  
Headquarters 79th Infantry Division

Colonel J. H. Hagan, O-7185  
Headquarters XV Corps

Colonel R. N. Hagerty, O-7618  
Commanding Officer, Infantry Regiment,  
94th Infantry Division

Colonel T. H. Hayes, O-19556  
Commanding Officer, 310th Infantry Regiment,  
78th Infantry Division

Colonel J. A. Heintges, O-20281  
Commanding Officer, 7th Infantry Regiment,  
3d Infantry Division

Colonel B. F. Hurless, O-7417  
Commanding Officer, 406th Infantry Regiment,  
102d Infantry Division

Colonel H. J. John, O-15802  
Headquarters 70th Infantry Division Artillery

Colonel R. G. Löwe, O-16800  
Headquarters XV Corps

Colonel C. P. Lynch, O-8247  
Headquarters XXIII Corps

Colonel G. P. Lynch, O-16226  
Headquarters 102d Infantry Division

Colonel E. H. McDaniel, O-16497  
Chief of Staff and Regimental Commander,  
29th Infantry Division

Colonel J. C. Macdonald, O-8402  
Commanding Officer,  
4th Mechanized Cavalry Group

Colonel F. J. Murdoch, Jr., O-19853  
Chief of Staff, 1st Infantry Division

Colonel J. A. Nichols, O-9699  
Chief of Staff, 78th Infantry Division

Colonel J. G. Ondrick, O-18804  
Commanding Officer, 309th Infantry Regiment,  
78th Infantry Division

Colonel W. A. Robinson, O-15292  
Commanding Officer, 314th Regiment,  
79th Infantry Division

THE GENERAL BOARD  
UNITED STATES FORCES, EUROPEAN THEATER  
APO 408

LIST OF COMBAT OFFICERS QUESTIONED

Colonel W. T. Scott, O-7340  
Commanding Officer, 101st Infantry Regiment,  
26th Infantry Division

Colonel E. M. Van Bibber, O-17789  
Commanding Officer, 313th Infantry Regiment,  
79th Infantry Division

Colonel J. C. Welch, O-12229  
Headquarters XV Corps

Colonel J. Williamson, O-19900  
Commanding Officer, 18th Infantry Regiment,  
1st Infantry Division

Lieutenant Colonel G. Cole, O-19917  
Commanding Officer, 629th Tank Destroyer Battalion

Lieutenant Colonel J. T. Corley, O-21325  
Battalion Commander, 26th Infantry Regiment,  
1st Infantry Division

Lieutenant Colonel R. H. Douglas, O-19212  
Headquarters 99th Infantry Division

Lieutenant Colonel E. F. Holton, O-20241  
Battalion Commander, 315th Infantry Regiment  
79th Infantry Division

Lieutenant Colonel W. H. Jordan, O-20249  
Battalion Commander, 109th Infantry Regiment  
28th Infantry Division

Lieutenant Colonel R. W. Keyes, O-342797  
Battalion Commander, 311th Infantry Regiment  
78th Infantry Division

Lieutenant Colonel H. Lutz, O-235866  
Battalion Commander, 310th Infantry Regiment,  
78th Infantry Division

Lieutenant Colonel L. B. Ramsey, O-23553  
Battalion Commander, 7th Infantry Regiment,  
3d Infantry Division

Lieutenant Colonel W. B. Rosson, O-23556  
Headquarters 3d Infantry Division

Lieutenant Colonel R. H. Schellman, O-22002  
Headquarters 78th Infantry Division

Lieutenant Colonel J. D. Scott, O-15885  
Headquarters 393d Infantry Regiment,  
99th Infantry Division

Lieutenant Colonel J. W. Sears, O-366078  
Headquarters 311th Infantry Regiment,  
78th Infantry Division

Major C. R. Gibbs, O-386843  
Headquarters XXI Corps

Captain L. E. Stenstrom, O-1176205  
Headquarters 63d Infantry Division

THE GENERAL BOARD  
UNITED STATES FORCES, EUROPEAN THEATER  
APO 408

REPORT ON THE INFANTRY DIVISION

SECTION I

INTRODUCTION

In accordance with a directive (Appendix 1) a committee was designated to make a study of the infantry division. The results of this study were to be incorporated in a report covering the organization, equipment and tactical employment of the infantry division to include recommendations for such changes as combat experience in the European Theater indicated were advisable.

Every effort was made to obtain the views of experienced combat leaders available in the European Theater. Questionnaires completed by over 50 officers were received and a summary of their opinions has been charted and shown in Appendix 13. After action reports of combat units with outstanding records were studied and analyzed. Full consideration was given to other records and available studies which have been prepared on this subject, or its various phases, by Army Boards, the War Department Observers Board, Army Equipment Review Boards, boards detailed by infantry divisions and Battle Experiences. Finally, a group of combat leaders who had fought throughout the European Campaign were assembled in conference and their views obtained (see Minutes of Conference, Appendix 15). The opinions and suggestions derived from these sources were carefully analyzed and the result forms a studied evaluation of the combat lessons of the campaign in the European Theater.

In its approach to this study, the committee has kept in mind the great advantage of preserving flexibility in the employment of supporting units such as artillery, engineers and others by retaining them in higher echelons rather than assigning them organically to divisions. It also has been impressed with the loss of mobility and maneuverability of the division as units and numbers are added to it. The committee therefore has been reluctant to add units to the division.

On the other hand, the committee feels that there are over-riding advantages in assigning organically to the division supporting units which habitually had to be attached to it. The committee is supported in this view by the almost unanimous opinion of the combat leaders it has questioned. The advantages result principally from greater esprit de corps and teamwork, better understanding of standing operating procedures and an increase in morale of the attached units. These units want to wear the division shoulder patch and to feel that they have a home.

The General Board has based the conclusions and recommendations embodied in the following report upon a careful consideration of these combined factors. The resulting infantry division represents the most practical and desirable organization for the accomplishment of its mission and affords a departure point for continuous future developments.

## SECTION 2

### DISCUSSION

#### 1. General.

The infantry division is the basis of organization of the field forces. It is the smallest unit that is composed of all the essential ground arms and services, and which can conduct, by its own means, operations of general importance. It can strike or penetrate effectively, maneuver readily and absorb reinforcing units easily. It can act alone or as a part of a higher unit. Its combat value is derived from its ability to combine the action of the various arms and services to maintain combat over a considerable period of time (FM 100-5, par 1010). Experience in the European Theater indicates that the major subordinate units of the infantry division were insufficient in strength and general composition to insure the division's ability to conduct offensive and defensive operations independently with maximum efficiency. The absence of tanks in the division organization was especially felt.

#### 2. Organization and Equipment.

a. The close relationship between the organization of the various units of the division and the types of major items of equipment used by them has necessitated that they be considered together. In evaluating combat experiences and lessons of World War II, careful consideration was given to the mission of each unit. The major units of the division and proposed additional units will be discussed in the following order in subsequent paragraphs:

- Division Headquarters
- Special Troops
- Infantry Regiment
- Division Artillery
- Anti-Aircraft Artillery
- Tank Regiment
- Cavalry Reconnaissance Troop (Squadron)
- Engineer Battalion (Regiment)
- Medical Battalion
- Reinforcement (Replacement) Battalion (Cadre)

#### b. Division Headquarters.

Combat experience in the European Theater indicates that the present division headquarters, with only minor changes, is satisfactory for the performance of its mission. Considerable sentiment was developed for elevating the rank of G-3 to full colonel and for the elimination of the position of assistant division commander. In the latter case the chief of staff would be raised to the rank of brigadier general and assume the duties of second in command with a deputy chief of staff assisting in administration and staff coordination. However, a majority of the combat leaders questioned indicated that they preferred the present organization. Therefore, no change in the present organization is recommended.<sup>1-13</sup>

#### c. Special Troops.

(1) Headquarters Company. The personnel at present assigned to headquarters company is adequate for efficient operation of the division command post.<sup>1-11</sup> During the European Campaign some divisions augmented this company but there is no evidence that additional personnel is needed permanently. Recommendations have been present-

ed in another report prepared by The General Board for the inclusion of six liaison type airplanes in the headquarters company for command and reconnaissance missions at the discretion of the division commander. This requires the addition of six officers and six men to this company and these have been included in the strength shown on Appendix 3.

(2) Military Police Platoon. The military police are charged with the enforcement of traffic regulations within the unit area; the maintenance of order and the enforcement of military laws and regulations; the protection of property; the handling of prisoners of war; the control of the circulation of individuals; the operation of straggler lines; and other missions as may be assigned by the unit commander (FM 19-5, par 206). The unanimous opinion of all combat leaders is that the military police platoon is wholly inadequate to perform its mission, and should be increased to company size. 15-16 Sorely needed riflemen were used in every division to augment this platoon during combat. A company (Appendix 3) has therefore been recommended.

(3) Ordnance Company. The mission of the Ordnance Department in the field is to store and issue ordnance general supplies and ammunition; to inspect, repair, alter and maintain ordnance material in the hands of troops and in storage; to administer the field establishments; and to provide technical information and guidance (FM 9-5, par 1). During operations in Europe the division ordnance company was able to perform only 30 to 60 percent of the third echelon work required. As a result, a medium maintenance company was habitually attached to support each division. The present inadequacy, together with the addition of weapons and vehicles, which will be discussed later in this study, requires a substantial increase in ordnance facilities. A canvas of 39 officers assigned as ordnance officers with infantry divisions during combat revealed that 30 of them deemed an increase in the ordnance company mandatory. With the addition of tank units to the division, a heavy maintenance company (tank) becomes necessary. Profiting by experience gained in the successful supply and maintenance of the armored divisions in combat by their ordnance battalions, the Ordnance Section of The General Board has recommended a similar organization for the infantry division. The headquarters company of this battalion handles all ordnance supply matters of the division; the medium maintenance company takes care of the armament and maintenance of wheeled and general purpose vehicles while the heavy maintenance company (tank) is responsible for tank maintenance. The General Board has therefore accepted this type battalion (Appendix 3) as being the minimum organization required. 7-11, 14, 18-20

(4) Quartermaster Company. The mission of the Quartermaster Corps is to efficiently and economically provide food, clothing, equipment, transportation and similar services (FM 10-5, par 1). Other services which are desired in the quartermaster unit include additional facilities for shuttling troops, shower facilities, laundry service and clothing exchange. 19, 20 Interviews with more than 50 combat leaders indicate these increases. Both tactical and service units were continually called upon for transportation which they could furnish only at the expense of their own operations. The inadequacy of presently assigned transportation has often necessitated displacement of important installations by shuttle, delay in supplies and delay in strategic movement of troops to take advantage of tactical opportunities. 34-36 It was thought advisable to combine the miscellaneous services, shower, clothing exchange, laundry and repair services in a utilities company. This company will have the facilities to attach shower and clothing exchange units (teams) to each infantry regiment and have several for the other units of the division. Laundry and repair services will be performed by the personnel of the utilities company in the quartermaster battalion area. This will relieve the combat troops of the neces-

sity of carrying extra clothing and will also relieve them of the administrative details in connection therewith. A small quartermaster battalion (Appendix 3) consisting of a headquarters and service company, a utilities company and two truck companies is therefore recommended as being necessary. 1-11

(5) Signal Company. The Signal Corps is charged with the responsibility of: signal training, photography, signal intelligence, signal supply (including repair and maintenance) and signal communication (FM 7-24, par 6). In the infantry division communication is of utmost importance. Upon this factor depend command and control, both of which are essential for successful operation in combat. Experience indicates that on many occasions communication was impaired or proved inadequate due to insufficient personnel. Linemen for repair and maintenance of telephone lines and operators for switchboards and radios are not provided for in sufficient number to insure adequate and continuing communication.<sup>15-24</sup> Early in World War II, realizing the necessity for such an increase, the Theater Commander verbally authorized an addition of 52 men for the signal companies of some divisions. This augmentation was later authorized for all divisions in the European Theater by War Department letter, file AG 322 OB-1-GNGCT-M, subject: "Activation, Reorganization and Augmentation of Divisional, Corps and Army Units", dated 26 March 1945.<sup>27</sup> However, a still greater supplementation of signal personnel is required.<sup>26, 36</sup> The General Board considers that the addition of 37 men to the 52 previously authorized is required to enable the company (Appendix 3) to perform its mission. 1-11

#### d. The Infantry Regiment.

The mission of the infantry regiment on the offensive is to close with the enemy and destroy or capture him (FM 7-40, par 150). The mission on the defense is, with the support of other arms, to stop the enemy by fire in front of the battle position, to repel his assault by close combat if he reaches it, and to eject him by counter-attack if he succeeds in entering it (FM 7-40, par 234 b). To accomplish these missions poses the question of the most efficient combination of close support infantry weapons. Maneuverability and the ability for rapid movement for exploitation are of paramount importance. For the regiment to combat and destroy the enemy most effectively, experience indicates that some changes are desirable in the present combination of supporting infantry weapons in the combat team. General strength and size are adequate, but slightly different characteristics in basic weapons are desired. It should be noted that the questionnaire summary (Appendix 13) developed a majority opinion for the infantry regimental commander to be a brigadier general in keeping with his responsibilities on the battlefield. Discussion of the regiment (Appendix 4) can best be presented by examination of the major subordinate units. 1-11

(1) Regimental Headquarters Company. The present unit is subdivided into two main parts: the communication platoon and the intelligence and reconnaissance platoon.

(a) The communication platoon is charged with establishing, maintaining and operating the various means of signal communication between regimental headquarters and subordinate units in conformity with the tactical plan and current signal operation instructions. It operates means of communication with supporting units and higher headquarters and may establish communication with adjacent units and with airplanes (FM 7-25, par 12). Adequate and continuous communication is indispensable and provides the regimental commander with his most effective means of control. Sufficient personnel to perform this function is mandatory. Experience proved that additional personnel is necessary for the installation and maintenance of wire lines and oper-

ation of switchboards and radios. 1-11, 15-27 To provide for this continuous 24-hour service, it is recommended that 10 men (linemen, radio and switchboard operators) be added to the present communication personnel.

(b) The principal mission of the regimental intelligence and reconnaissance platoon is to serve as the special intelligence agency of the regimental commander for the collection of information under the supervision of the regimental intelligence officer (S-2). The platoon is also charged with counter-intelligence measures and surveillance (FM 7-25, par 9). To accomplish this mission and to provide the regimental commander with vital information of the enemy, the platoon must operate patrols, man observation posts and coordinate the intelligence activities of the regiment. 38 During the European Campaign, it was proved that the intelligence and reconnaissance platoon lacked necessary strength to fulfill these missions and it is recommended that this platoon be augmented by the addition of 13 men. 1-11

(c) No provision was made in the tables of organization and equipment of the infantry regiment for personnel to guard command post installations, operate straggler lines, aid in the processing of prisoners of war, provide guides for marking routes and control of traffic. These jobs were of such importance that every infantry regiment in the European Theater organized a military police platoon to perform these functions. 20, 25 It has therefore been considered necessary to recommend the addition of a military police platoon consisting of one officer and 32 enlisted men. 1-11

(d) From the standpoint of morale it was considered necessary in many regiments to provide facilities for the entertainment of troops during rest periods. The majority of infantry regiments formed bands for this purpose. This personnel was also used to augment the regimental headquarters company personnel in the performance of their duties. However, The General Board believes the division band, if properly used, could take care of this need and that the inclusion of a band in the infantry regiment is not justified.

## (2) Cannon Company.

The general mission of the cannon company is to provide close and continuous fire support to the infantry regiment (FM 7-37, par 7 a). To provide this support the weapon must be capable of being displaced rapidly over all types of terrain traversed by foot troops with minimum disclosure of position and movement. Equipped with a towed weapon this company was unable to satisfactorily accomplish its mission. 19-21 Considerable sentiment developed to eliminate the company primarily because of this lack of mobility and because, in a majority of situations, it was tied in with the fire direction center of the supporting division artillery in the massing of fire. Some suggested that a 4.2" mortar company replace it, but while the mortar is an excellent weapon, it is not a satisfactory substitute for the supporting infantry cannon. 20, 44 The equipment review boards of the various armies in the European Theater agreed that the cannon company must be given an improved weapon and recommended a 105mm howitzer on a self-propelled mount. 22, 23 After consultation with many experienced division commanders, General Omar N. Bradley, in a letter to the Commanding General, European Theater of Operations, file 322 (G-3), dated 5 February 1945, subject: "The Infantry Cannon Company", stated that the present weapon was unsatisfactory and that a change was necessary. 30, 33 The Theater Commander, in a letter to The Adjutant General, War Department, Washington, D.C., file AG 322 Op OG, dated 15 February 1945, same subject, confirmed the above opinion by recommending replacement of the present weapon with a self-propelled, close direct fire, support weapon, preferably, a 105mm howitzer. 40, 45 The majority of combat leaders were of

the opinion that the fire support of the 105mm howitzer under the immediate control of the regimental commander was essential but that it must be self-propelled to furnish him with a suitable accompanying gun. The conference on the infantry division, 20 November 1945 (Appendix 15), strengthened the expressed desire for a 105mm howitzer and stressed the requirement for a light self-propelled mount having a low silhouette and with overhead cover. The General Board agrees with this view and feels that an energetic effort should be made to develop such a weapon. However, pending the development of this weapon, it is felt that the 105mm howitzer mounted on the medium tank (assault gun) is the best weapon available at present and is recommended to replace the present cannon. 1-11, 31

### (3) Anti-Tank Company.

The mission of the anti-tank company is to provide protection to the regiment or its elements against attacks of hostile armored vehicles, whether in offensive or defensive combat. Surprise, mobility, aggressiveness and flexibility are essential. The present 57mm towed anti-tank gun is unsatisfactory.<sup>25</sup> Lack of cross-country mobility, coupled with the fact that the penetrating power of the 57mm projectile is insufficient to stop the modern tank, makes it imperative that another weapon be substituted.<sup>28-33</sup> The majority of experienced combat leaders agree that the present anti-tank weapon should be replaced by a self-propelled tank destroyer or a medium tank, with a clear majority favoring the medium tank. Present recoilless weapons lack the necessary penetrating power demanded in an effective regimental anti-tank weapon and other protection is therefore mandatory. Opinions expressed by combat leaders and division boards appointed for study of the infantry division indicated a desire for the mobile striking force of a medium tank armed with a 90mm gun.<sup>17-21</sup> This would furnish the flexibility, maneuverability and penetrating power required. Many of our combat leaders were of the opinion that a light self-propelled weapon with a low silhouette and capable of stopping a tank should be developed.<sup>35</sup> However, pending the development of such a weapon, current thought is that the medium tank is the best anti-tank weapon. All combat leaders attending the conference on the infantry division (Appendix 15) recognized the necessity for anti-tank protection and agreed that the medium tank was the best anti-tank weapon at present. In addition, it was their almost unanimous opinion that it was better to have a tank regiment of three medium tank battalions under division control than a regiment of two medium battalions under division control with an anti-tank company, armed with the medium tank, organic in the infantry regiment. With the three battalion tank regiment organic in the division there would be a battalion of medium tanks available as a regimental combat team member for both tank and anti-tank missions, or the tanks could be otherwise employed to best meet the requirements of the situation. After careful consideration of all of the above factors, The General Board has decided in favor of a tank regiment of three battalions and has therefore recommended the elimination of the anti-tank company. 1-11

### (4) Service Company.

In providing a continuous and even flow of all classes of supply, servicing the regiment in conformity with the tactical situation and providing second echelon maintenance, the service company needs few additions. The handling of class I and class II supplies is the biggest job of the receiving and distributing group of the service company.<sup>15,25</sup> Personnel assigned to perform these functions was not adequate to meet the demands. The ammunition section was short three men and a truck for the purpose of moving ammunition. Also a necessary function in combat is provision for a graves regis-

tration service. 20 No personnel is available for this job in the present table of organization and equipment. All regiments in combat were faced with the need for this service and consequently an officer and enlisted assistants had to be made available from other jobs within the regiment. To correct these deficiencies it is felt advisable to augment this company by the addition of four enlisted men and two 2½-ton trucks to the receiving and distributing group, three men and one 2½-ton truck to the ammunition section and one officer, five enlisted men and one 2½-ton truck to the graves registration section. Included in the service company is personnel who normally operate away from the company under the supervision and responsibility of other commanders. These include the battalion S-A's, the assistant S-1, the assistant S-3 and the enlisted men of the S-1 and S-3 sections. It appears desirable to assign them to the units with which their work is directly connected. 4-11

#### (5) Battalion Headquarters and Headquarters Company.

The problems encountered by this unit are closely parallel to those of the regimental headquarters company. Communication is the greatest problem and insufficient personnel is presently allotted to insure a continuing and adequate wire and radio net. 15, 24, 26 Experience indicates that an increase in the personnel of the communication platoon by two wire teams is necessary. 20 No enlisted men are available to perform the functions of command post guards, escorts for prisoners of war and other miscellaneous duties which arise in combat. Provision should be made for personnel to perform these duties without depleting the strength of the ammunition and pioneer platoon or the rifle companies. For this purpose a section, 12 enlisted men, has been added as a military police section. Supply of the battalion is a responsibility of the battalion commander; however, the battalion supply officer (S-4) is not assigned to the battalion and is answerable only indirectly to the battalion commander. It is thought best to assign this officer to the battalion. The inability of the battalion anti-tank platoon to furnish adequate protection against hostile armor, for reasons listed earlier under the heading of the anti-tank company makes it desirable to eliminate this platoon. 4-11

#### (6) Rifle Company.

The mission of the rifle company in the offensive initially is to capture a locality, or localities, held by the enemy. To do this it must close with the enemy by a combination of fire and maneuver. It must take advantage of every accident of terrain to conceal and protect the company, or any part of it, while in movement. Every movement must be covered by fire delivered by part of the company, by company supporting weapons, or both, and so placed that it neutralizes that part of the enemy's infantry which could otherwise effectively fire on the individuals or elements that are moving; or by battalion supporting weapons prepared to deliver such fires (FM 7-10, par 21 a (1)). On the defensive the rifle company may be employed to organize, occupy and defend a company defensive area on the main line of resistance or it may constitute the battalion reserve (FM 7-10, par 66 b). By this it is evident that movement is an integral and important part of company tactics. The basic maneuvering fighting unit of the company is the rifle squad. The squad must have the fire power to make it an effective striking force. The squad consists of two groups: a base of fire consisting of the automatic rifle group, and a maneuvering element composed of riflemen. Automatic fire is essential to the base of fire and an increase in the fire power of this group could be obtained by the addition of another automatic rifle, but this would be at the expense of the maneuvering element and appears undesirable. Actually, with foreseen improvement in reduced weight and

increased fire power of the present M-1 rifle, no additional automatic weapon is necessary.<sup>1-11,19,20</sup> However, in order to take full advantage of anti-personnel effect of rifle grenades, the basis of issue of rifle grenade launchers should be increased to one per rifle and carbine. An assault section has been added to the weapons platoon of each company as a result of combat experience in the European Theater. It consists of one officer and 18 enlisted men with six bazookas\*. During combat the bazooka\* demonstrated its assault capabilities against pill-boxes, bunkers and other entrenched obstacles and weapons in a highly satisfactory manner. In addition to its primary assault mission it has a secondary but most important mission of furnishing anti-tank protection for the front line units.<sup>15,17,32</sup>

#### (7) Heavy Weapons Company.

The mission of the heavy weapons company is to give continuous close support and protection to the rifle companies. Protection includes protection of the flanks; protection of reorganizations and protection of assembly areas and bivouacs (FM 7-15, par 8). The weapons in the heavy weapons company were able to perform this mission. The present machine gun (water-cooled) proved to be awkward to handle and the gun crews had difficulty in manhandling the weapon during the long displacements. Its lack of maneuverability in wooded or difficult terrain was a decided disadvantage. Many units in combat replaced the heavy gun with the light machine gun.<sup>17-20</sup> While the light gun is capable of being hand carried long distances over all types of terrain, it lacks the sustained fire power of the heavier water-cooled weapon. Some thought was given to placing both types of weapons in the company, with the light guns primarily for offensive purposes and the heavy guns for the defensive role.<sup>47</sup> However, the combat leaders attending the conference on the infantry division (Appendix 15) preferred to retain only the heavy machine gun but recommended that a weapon be developed combining the sustained fire power of the heavy and the maneuverability of the light. With the development of a light flexible mount it was thought that most of the difficulty would be eliminated. The General Board concurs with the view developed at the conference and has recommended the retention of the heavy machine gun with the recommendation that it be lightened as to weight, retaining or improving the present fire power and making the gun more flexible and maneuverable.<sup>46</sup>

The fire power of a mortar platoon at the immediate call of the battalion commander is needed. Lessons learned from the European Campaign point out that the support of battalion weapons must be continuous and, therefore, they must be capable of being displaced by hand or transported across country.<sup>33,48</sup> There was a suggestion that the 4.2" mortar replace the 81mm mortar but a clear majority (47 out of 57) preferred the 81mm mortar. 1-11

#### (8) Recoilless Weapons and Other Recent Developments.

It is believed important to emphasize here that the conclusions reached and recommendations made in this study are based wholly upon experience in the European Theater during World War II and should not, therefore, be understood as implying that full consideration has been given to newly developed equipment with which troops in the European Theater had no adequate experience.<sup>47</sup> This statement applies especially to the various types of recoilless cannon and rocket launchers which, because of their apparent inherent mobility and an adaptability to use in direct association with foot troops under the most unfavorable terrain conditions, may produce great changes in the concept of infantry supporting fires and anti-tank defense. It also applies to new styles of mortars or mortar ammunition which may improve

mobility, increase fire power, and extend the usable range of such weapons in both directions. It is considered of the utmost importance that intensive development be continued towards the goal of combining maximum fire power with maximum battlefield mobility within the infantry regiment and battalion, and omission of mention of the above types of new weapons should not be taken as indicating any opinion either for or against them.<sup>21-23</sup>

#### e. Division Artillery.

Experience in combat proved that the division artillery had to be augmented considerably by both light and medium artillery to furnish adequate close fire support for the infantry units. While this was not unexpected it is felt that another medium battalion should be assigned organically. The one organic 155mm howitzer battalion was not able to cover the entire division front and had to be habitually augmented by another battalion to correct this deficiency as well as to have a unit to provide continuous fire support during forward displacement.<sup>20</sup> For this reason and in the interest of better teamwork and morale, it is considered advisable to assign this additional battalion organically. This is favored also by the majority of artillery officers.<sup>49,50</sup> In the case of the light battalion the situation is slightly different. In the interest of control and the most economical manner of increasing the organic fire power, all division artillery officers of the Seventh Army and a majority of others favor a three-battery battalion of six-gun batteries.<sup>18,38</sup> While some expressed a desire for a four-battery battalion, control is a deterring factor. The addition of two guns per battery increases the fire power by 50 percent at an increase of only 10 percent in personnel. It was found that additional observers were needed for more efficient support, to replace losses and to maintain a high standard of efficiency from reinforcing artillery battalions.<sup>49,50</sup> The General Board feels that the number of observers should be doubled in the organic division artillery. (Appendices 5, 6 and 7.)

The conference on the infantry division, 20 November 1945 (Appendix 15), developed the desire that all batteries, including the 155mm howitzer, be increased from four to six guns as an economical method of increasing fire power. The General Board agrees with this view. In the opinion of the leaders at this conference it was desirable that the 105mm howitzer be self-propelled and that the 155mm howitzer also should be self-propelled as soon as a self-propelled carriage has been developed for this weapon possessing the same ballistic qualities as the towed 155mm howitzer. All agreed that the mounts of these weapons should be lightened, have as low a silhouette as possible and have overhead cover.

In view of the advent of the posit fuze and of the threat from aerial bombing and strafing, The General Board recognizes the great desirability of providing more protection for personnel in the battle area. It feels that there must therefore be a definite movement towards providing vehicles with some armor protection, particularly overhead, wherever practicable. In line with this idea and because self-propelled artillery has greater cross-country mobility than towed, The General Board believes that the organic division artillery should be self-propelled. The General Board realizes that the present self-propelled 105mm howitzer has serious deficiencies; it is undesirably heavy, lacks overhead cover and is not capable of high-angle fire. Those deficiencies must be removed, but it is felt that they should not prevent the adoption of the self-propelled weapon (105mm howitzer) at this time. The lack of overhead cover also applies to the towed weapon. The requirement for high-angle fire, which applies to only a small portion of the fire missions, may be met by the attachment of

reinforcing light artillery from the corps. Corps and army artillery, on account of the need for maximum road mobility, probably should remain towed, at least for the present. The General Board has had no experience with the latest self-propelled 155mm howitzer; however, it is believed that when a self-propelled 155mm howitzer is produced without loss of ballistic qualities as compared to the towed weapon, it should replace the towed howitzer in the organic division artillery.<sup>21-23</sup> The General Board is convinced that intensive effort should be made to produce such a self-propelled 155mm howitzer, but realizes that pending its completion the 155mm howitzer must remain towed. 1-11

#### f. Anti-Aircraft Artillery.

During combat practically all divisions had an attached anti-aircraft artillery battalion for protection against hostile low-flying aircraft. A canvas of more than 50 experienced combat leaders revealed that with few exceptions they desired a similar battalion to be an organic part of the infantry division.<sup>51,52</sup> The advantages of teamwork, morale and training in standing operating procedures dictate assignment rather than attachment. The Anti-Aircraft Artillery Section of The General Board recommended (Appendix 14) that a regiment consisting of two battalions be organic in the division. However, the experience of the fighting in the European Theater does not indicate that more than one battalion is required.<sup>18,33</sup> It was the unanimous thought of the officers attending the conference on the infantry division (Appendix 15) that only one battalion should be organic. While the increasing speed of aircraft might tend to indicate a requirement for additional anti-aircraft artillery in the future, it is expected that improvements in weapons, fire control and ammunition may offset this. In view of the above, one battalion (Appendix 8) is recommended as being sufficient as an organic part of the division.

#### g. Tank Regiment.

It is the unanimous opinion of the combat leaders of the European Theater that armored units should be organic in the infantry division. Opinions differ only as to the amount of armor to be assigned and its disposition within the division. The average amount recommended is two battalions with the majority favoring division control.<sup>33</sup> A considerable minority expressed a desire for a tank regiment of three battalions with other minorities recommending a company or a battalion organic in each infantry regiment. However, by concentrating the armor under division control, the division commander has at his disposal a hard striking reserve force capable of decisively influencing the course of action either by attachment to combat teams or otherwise in accordance with the situation. This would prevent unnecessary waste of tank power and also simplify maintenance problems. During combat one medium tank battalion and one tank destroyer battalion were normally attached to a division. Since the medium tank and the tank destroyer are now armed with the same caliber weapon, it is felt that the medium tank is preferable due to its better protection and all around use.<sup>38-43,28-30</sup> General Omar N. Bradley stated in a letter to the Theater Commander, file 322 (G-3), 5 February 1945, subject: "The Infantry Cannon Company", that most experienced combat leaders preferred two medium tank battalions organic in the infantry division to one medium tank battalion and one self-propelled tank destroyer battalion.<sup>18-23</sup> The conference on the infantry division (Appendix 15) developed a strong majority opinion for a tank regiment of three medium tank battalions and the consequent elimination of the anti-tank company in the infantry regiment. It was felt that it was best to concentrate all tanks under division control. By having three battalions, a more equitable distribution of tank effort could be made. A tank battalion, or company, could be made available as a regimental

combat team component when necessary. At the same time both tank and anti-tank missions could be met satisfactorily. With the improved bazookas\*immediately available in the rifle companies for local protection against armor, tank units can be used as a mobile reserve striking force. The great majority of combat leaders believe that the light tank company should be eliminated from the medium tank battalion in the infantry division. It is the general opinion that a regiment consisting of three battalions having three medium tank companies each would furnish all the tank power required. It should be noted that (Appendix 9) a liaison section of six liaison planes has been added to the tank regiment. This is in accordance with the recommendation in another study prepared by The General Board, "Liaison Aircraft With Ground Units", in which two planes per battalion are recommended. After careful consideration of the above-mentioned factors, The General Board has recommended that a tank regiment, consisting of three medium tank battalions, each of three medium tank companies, be made an organic part of the infantry division. <sup>1-11,51,53-55</sup>

#### h. Cavalry Reconnaissance Troop (Squadron).

The cavalry reconnaissance troop, mechanized, infantry division, is the mobile reconnaissance element available to the division commander. Of the reconnaissance missions performed during combat, the majority were battle reconnaissance or reconnaissance in force. However, the troop had insufficient strength to accomplish desired results. Many divisions were reinforced by the attachment of cavalry squadrons to perform the intelligence and counter-intelligence missions required. A unit to gain information under the direct control of the division commander is essential. However, the unit so employed must have sufficient strength, speed, mobility and fire power to contact the enemy, obtain desired information and report that information to the commanding general. Armor and sufficient fire power are lacking in the present reconnaissance troop. A very strong minority of those questioned indicated a desire to replace the present company with a cavalry squadron. The officers attending the conference on the infantry division (Appendix 15) were unanimously in favor of adding a cavalry squadron as that was considered the minimum required to be effective. It was felt that anything less would be wholly inadequate. The General Board concurred with this view and has recommended that a cavalry squadron replace the reconnaissance troop (Appendix 10). <sup>18-23,38-43</sup>

#### 1. Engineer Battalion (Regiment).

The mission of the engineer combat battalion of the infantry division is to increase the division's combat effectiveness by means of general engineer work (FM 5-5, par 65). The present battalion was insufficient to effectively support the division in combat. Sufficient engineer personnel was not available for assignment to the regimental combat teams, clear mine fields, prepare demolitions, repair and construct bridges and maintain roads. <sup>38-43</sup> In a majority of cases a corps engineer battalion was required to maintain roads in the division area. It is felt that if this battalion is habitually in the division area it should be under control of the division engineer officer and be an organic part of the division engineer unit. At the conference on the infantry division (Appendix 15) it was indicated that it was habitual for one corps engineer battalion to be employed in each infantry division area during combat. This necessitated corps calling upon the army for a replacement battalion for each battalion allotted to a division area, and the army in turn calling upon the communication zone for battalions to replace those turned over to the corps. By assigning the additional battalion organically to the division this shifting would be obviated and thus better teamwork would result. The

expression of opinion of those attending the conference was that a regiment of two battalions should be organic in the division. The General Board has therefore recommended that a regiment of two battalions be made organic in the division (Appendix 11). 1-11, 19-23

#### j. Medical Battalion.

The medical battalion operated efficiently throughout the European Campaign in providing medical service for the care and evacuation of casualties from forward areas. 19, 20 Nevertheless, it was generally recognized that minor deficiencies existed in personnel, equipment and transportation. 38-43 The proposed medical battalion (Appendix 12) has corrected this situation and also made allowances to take care of the increases in the division. 1-11, 56

#### k. Reinforcement (Replacement) Battalion (Cadre).

The system of reinforcements during combat was unsatisfactory. It was originally intended that divisions would be rotated back to rear areas after a certain length of time in combat for purposes of recuperation and receiving and absorbing reinforcements. 17, 18 However, this never occurred and reinforcements (replacements) arrived on the battlefield too late for indoctrination or to allow time to fit these men into the organization. This was neither fair to the reinforcements nor to the organization. The reinforcement system did not operate to allow time to build up esprit or to contribute to that close personal teamwork so necessary for success on the battlefield. 25 It is the opinion of the great majority of combat leaders questioned on the subject that a reinforcement unit should be organic in the division to insure a flow of division-trained reinforcements when needed. These men would then be indoctrinated with the division spirit and standing operating procedures resulting in higher morale and more efficient teamwork. The officers attending the conference on the infantry division (Appendix 15) unanimously agreed to the recommendation presented by The General Board that a battalion cadre of six officers and 30 enlisted men be made an organic part of the division (Appendix 2). In another study (G-1 study on reinforcements) being prepared by The General Board the ratio of types of personnel to be placed in the full strength reinforcement battalion is being considered. Therefore no recommendation has been submitted in this study to cover that phase of the reinforcement subject. 1-11

### 3. Tactical Employment.

a. The tactical doctrines and principles set forth in Field Service Regulations and in various service manuals were proved successful in combat. Operations in the European Theater emphasized the fact that the basic doctrines of troop leading and staff functioning as outlined in our service manuals and as taught in our service schools are correct. It is cogent to note that, as indicated in the conclusions of the Operations Report of the First United States Army, the degree of success attained continues to be dependent upon the ability of the individual commanders to apply these doctrines properly. All combat leaders questioned on the subject recommend no change in the tactical role of the infantry division. Although a search of combat records, including after action reports, operation reports and Battle Experiences, reveals no material changes in the tactical employment of the infantry division, there are, nevertheless, several lessons of tactical significance which warrant discussion and emphasis here. 19-23, 38-43, 59, 60

(1) Air-Ground Liaison. Air-ground cooperation and liaison has been a much discussed subject as a result of the problems en-

countered in the early stages of World War II. Every division commander desired all the fire power he could obtain placed in front of his division. The destructive force of air bombs against organized defensive positions is realized by everyone.<sup>57-60</sup> The degree of accuracy of air bombing is the only deterrent to more extensive use of air support for immediate assistance to ground elements. To secure best results, air bombardment must be close enough to be followed by artillery fire covering the advance of the infantry, thus keeping the enemy positions continuously under fire during the entire approach to the position. This requires the utmost in coordination and cooperation between air and ground units. This was being more fully developed in the latter stages of the fighting in the European Theater. By means of close planning between air and ground staff officers, fighter-bomber aircraft were directed on specific close-in targets in front of the corps and divisions. This was facilitated by the use of very high frequency radio, permitting radio contact between the fighter-bombers, the fighter-bomber control center and the forward ground controller. While the theory of close-in air support was not new, the methods used bear mention as they were responsible for the success attained. The "horsefly" technique and "armored column cover" deserve special mention here as they symbolize the trend of close air support for ground elements. Briefly, "horsefly" technique may be defined as the method or procedure by which a forward observer or controller flying in a liaison type aircraft equipped with a very high frequency radio directs the activities of fighter-bombers against close-in targets or targets of opportunity in direct support of ground units. Similar technique was worked out by fighter-bombers and tank teams with the mission of providing cover for armored columns. The object of both, "horsefly" and the so-called "armored column cover", was the same - close cooperation between the ground elements and aircraft. This subject is covered more thoroughly in another study by The General Board under the subject: "Liaison Aircraft With Ground Force Units". The success attained in the advance through France and Germany strengthens the necessity for continued development to improve methods and techniques of coordination between air and ground elements.<sup>19,20,52</sup>

(2) Infantry Tank Coordination. Interest in infantry-tank coordination has been increased, as evidenced by the expressed desire of our combat leaders for organic tanks in the infantry division. Initial operations in the European Theater indicated that insufficient training had been conducted in infantry-tank cooperation prior to entry into combat. While our various service schools and manuals stressed the importance of the infantry-tank-artillery team, more attention was given to the infantry-artillery combination in actual training. The doctrines and techniques of the infantry-artillery team were firmly established prior to World War II. Combined training was carried on until infantry and artillery became thoroughly indoctrinated in the operational procedures so necessary to successful coordination on the battlefield. As a result the infantry-artillery team functioned successfully from the initial stages of combat. Operations emphasized that armor was essential to the advance of infantry against organized positions; conversely, armored attacks against organized infantry required the close follow-up of infantry troops to organize and hold the position.<sup>29,30,36-43</sup> Because of this mutual dependence, more stress should be placed upon coordinated training. This intimate relationship existing between infantry and tanks on the battlefield necessitates that they be thoroughly integrated into an effective fighting unit. The development of standing operational procedures and techniques between infantry and tanks must not be left until arrival in the combat zone.<sup>17-23,51-55,59,60</sup>

(3) Hedgerow Fighting. This is the name given to the type of fighting which took place in the hedgerow (bocage) country of

Normandy. It deserves special mention here because of the type of tactics developed. While nothing particularly new was developed as to use of weapons, special formations and combinations of arms were developed to advance through this unique type of terrain. The defense was favored as the hedgerow subdivided the terrain into small rectangular compartments. This permitted each compartment to be developed into a serious obstacle to advancing infantry. By tying in adjacent compartments to provide mutual support a more or less continuous band of strong points was developed across the front. The hedgerow was an ideal place for concealment of automatic weapons and anti-tank guns. It also permitted a minimum of defensive personnel, one man being able to operate more than one weapon by taking advantage of concealment afforded by the hedgerows. To effectively neutralize this type of resistance special coordination between infantry, tanks, engineers and supporting artillery was required.

The most effective method of attack proved to be by combined action of infantry, artillery, tanks and engineers with some tanks equipped with dozer blades or large teeth in front to punch holes through the hedgerows. Frontages had to be assigned according to specific fields and hedgerows instead of by yardage. Reduced distances and intervals between tactical formations also became necessary with cross hedgerows used as phase lines.

The rifle company moved usually in a box formation with two assault platoons in the lead followed by the support platoon and weapons platoon. The tanks moved with the leading infantry elements along with engineer demolition crews. During the advance, fire from mortars, grenades, automatic weapons and tank guns was directed against the hedges, especially the hedge corners. Some supporting tanks moved along the hedgerows parallel to the direction of the attack. As the tanks crossed each row the leading wave of infantry and combat engineers protected their advance against bazookas\* and other anti-tank weapons, while the supporting wave of infantry mopped up in rear and eliminated snipers.

The artillery concentrated on close support of the infantry-tank-engineer team, firing on hedgerows in advance to destroy enemy defensive positions and to keep down anti-tank fire. Air bombardment was also used in addition to the artillery to disorganize enemy positions in the path of advancing infantry and tanks. It is pertinent to remark here that this type of fighting brought out the importance and necessity of perfect teamwork and cooperation of the various combined arms. 17,19-23,29,40,57-60

(4) Aggressive Spirit. Too much can not be said about the necessity for bold and aggressive action on the part of the infantry. The desire to close with the enemy must be thoroughly stressed. Aggressive action and energetic forward movement proved to be essential to gain ground and to reduce casualties. The desire to stop and dig in when first fired upon must be discouraged. All observers were of the opinion that as soon as troops stopped their forward movement they immediately came under heavy mortar and artillery fire. Unless they moved forward promptly to come to close grips with the enemy, unnecessary casualties were sustained. Bold aggressive action is necessary to early success and to keep casualties to a minimum. It therefore becomes necessary that we stress the importance of aggressiveness in all our future training and of imbuing our men with the will to win that is so vital to success on the battlefield.

b. While operations in the Western European Campaign have indicated no necessity for changes in our present tactical doctrines, it can be expected that these doctrines will require modification with

the future development of improved weapons and equipment. It is pertinent to remark at this point that the tactical methods employed in World War II were vastly different and improved over those used in World War I. The fact that the United States Army had developed these modernized tactical methods during the years of peace permitted it to start with doctrines and methods that proved successful in battle. The tactics and techniques of the various arms, and of the combined arms, must be reviewed continuously in the light of new developments. The ever increasing trend toward armor protection to reduce casualties, lighter weapons, improved as to fire power, range and destructive capabilities, and speedier means of transportation, demand continuous adjustments in tactical methods and techniques in order to fully exploit the improvements in the weapons of war. Only by this means can we hope to be fully prepared for the next war.

### SECTION 3

#### CONCLUSIONS

4. In view of the foregoing discussion, The General Board concludes as follows:

a. The command and staff organization of division headquarters is satisfactory.

b. The service units are deficient in men and equipment for adequate support of the combat elements; the ordnance and quartermaster units should be increased to battalion size and the other units considerably augmented by additional personnel.

c. The cannon company is necessary for the close support of the infantry regiment, but the present cannon is unsatisfactory and should be replaced by the 105mm howitzer mounted on the medium tank (assault gun) pending development of a lighter, smaller, self-propelled cannon, having equivalent ballistic qualities.

d. The present anti-tank company weapon (57mm towed gun) is unsatisfactory and should be eliminated. Since the medium tank is recognized as the best anti-tank weapon at present the anti-tank company should also be eliminated and its mission taken over by the organic tank unit of the division.

e. Infantry weapons should be lighter and more maneuverable; the automatic rifle is preferred to the light machine gun in the rifle squad; the 81mm mortar is preferred to the 4.2" mortar in the heavy weapons company; the heavy machine gun must be improved, retaining its sustained fire power but reducing its weight and increasing its flexibility.

f. The rank of the infantry regimental commanders should be raised to brigadier general.

g. Except for minor additions of personnel to regimental headquarters company, battalion headquarters company and service company for communication, military police, intelligence and reconnaissance and administrative duties, the general composition of the other units of the infantry regiment is adequate.

h. The division artillery is deficient in 155mm howitzer power and an additional battalion should be assigned organically. All batteries, 105mm and 155mm, should be increased to six guns. The 105mm howitzers should be self-propelled and the 155mm howitzer should remain towed pending development of a self-propelled 155mm howitzer

possessing the ballistic characteristics of the towed weapon. All self-propelled mounts should be lightened, should be capable of high-angle fire and should be provided with overhead cover.

i. An anti-aircraft artillery battalion should be an organic part of the infantry division.

j. Armored units should be organic in the infantry division. A medium tank regiment comprising three battalions of three companies each should be an organic part of the infantry division for the purpose of accomplishing both tank and anti-tank missions.

k. The reconnaissance troop should be replaced by a mechanized cavalry squadron.

l. The engineer battalion should be increased to a two battalion regiment.

m. A reinforcement (replacement) cadre, consisting of six officers and 30 men, should be made an organic part of the infantry division for the purpose of providing a nucleus to handle an organic reinforcement battalion within the division.

n. Every effort should be made to improve our present weapons and equipment and at the same time continue research for new and better weapons and equipment. While preliminary tests of recoilless weapons were favorable, more extensive tests should be conducted.

o. No material changes to our tactical doctrines as prescribed by Field Service Regulations and field manuals were brought out as result of combat experience in the European Theater. Tactical doctrines, methods and techniques of the various arms and of the combined arms must be continuously reviewed in the light of new developments.

#### SECTION 4

#### RECOMMENDATIONS

##### 5. It is recommended:

a. That the revised infantry division as presented in Appendices 2-12 inclusive be adopted.

b. That pertinent Tables of Organization and Equipment be amended by appropriate agencies of the War Department.

c. That the rank of brigadier general be authorized for the infantry regimental commander.

d. That continuous research be conducted toward the development of lighter, more mobile and more powerful weapons.

e. That our tactical doctrines and methods be the subject of continuous study so that they may be kept abreast of new developments in the weapons and means of making war.

## BIBLIOGRAPHY

1. Recommendations for changes in TO/E of Infantry Division submitted by 1st Infantry Division
2. Recommendations for changes in TO/E of Infantry Division submitted by 3d Infantry Division
3. Recommendations for changes in TO/E of Infantry Division submitted by 9th Infantry Division
4. Recommendations for changes in TO/E of Infantry Division submitted by 29th Infantry Division
5. Recommendations for changes in TO/E of Infantry Division submitted by 36th Infantry Division
6. Recommendations for changes in TO/E of Infantry Division submitted by 78th Infantry Division
7. Recommendations for changes in TO/E of Infantry Division submitted by 84th Infantry Division
8. Recommendations for changes in TO/E of Infantry Division submitted by 100th Infantry Division
9. Recommendations for changes in TO/E of Infantry Division submitted by 102d Infantry Division
10. Recommendations for changes in TO/E of Infantry Division submitted by 106th Infantry Division
11. Recommendations for changes in TO/E of Infantry Division submitted by XVI Corps
12. Army Ground Force, Report No. 630, WD Obsr Bd, 7 Feb 1945, "Combat and Staff Lessons, Seventh U.S. Army"
13. Report of Chaplain Section, The General Board, USFET, 26 Nov 45, subj: "Report on Chaplain Personnel for the Proposed Inf Div"
14. Report of Ordnance Section, The General Board, USFET, 25 Oct 45, subj: "Justification for Requirement of Ord Med Maint Bn to Support the Proposed Inf Div"
15. AGWAR Cable to ETOUSA, Ref No. WAR-91047, 31 May 1945
16. AGWAR Cable signed WARCOS to ETOUSA: Ref No. WAR-12510, 6 Jun 45
17. Army Ground Force, Report No. 191, WD Obsr Bd, 26 Aug 44, "Interviews with Commanders in Normandy, Aug 5 - 10, 1944"
18. Army Ground Force, Report No. 572, WD Obsr Bd, 6 Feb 45, "Proposed changes in Orgn & Equip"
19. Battle Experiences, First U.S. Army Gp, Hq Twelfth Army Gp, Hq, European Theater of Operations, U.S. Army, Period July 44 - Jun 45
20. Immediate Reports (Combat Observations), Headquarters European Theater of Operations, United States Army, APO 887, Nos 1 - 151, dated November 1944 - June 1945

21. Army Ground Force, Equipment Review Board, Parts I - II
22. European Theater Equipment Review Board
23. Twelfth Army Group Equipment Review Board
24. Army Ground Force, Report No. 378, WD Obsr Bd, 14 Nov 44, "Recommendations for Sig Equip in Inf Regt"
25. Army Ground Force, Report No. 492, WD Obsr Bd, 5 Jan 1945, "Fighting Strength of Inf Units"
26. Army Ground Force, Report No. 602, WD Obsr Bd, 8 Feb 45, "Changes in T/O & E Sig Co, Inf Div; Comm Plats, Hq Co, Inf Regt; Hq Co Inf Bns"
27. Ltr, WD, AG Office, 14 Jun 45, subj: "Changes to Inf Div" (with 1 Incl)
28. Ltr, Hq ETOUSA, file AG 322 OpGG, 18 Feb 45, subj: "Inf Cannon Co"
29. Army Ground Force, Report No. 195, WD Obsr Bd, 28 Aug 44, "Lessons from Present Campaign, 4th Inf Div and 9th Inf Div"
30. Army Ground Force, Report No. 395, WD Obsr Bd, 23 Nov 44, "Changes in T/O & E, Infantry Regiment"
31. Army Ground Force, Report No. 504, WD Obsr Bd, 3 Jan 45, "Changes in T/O & E, Inf Cn Co and AT Co"
32. Army Ground Force, Report No. 780, WD Obsr Bd, 4 Apr 45, "Bazookas and AT Guns"
33. Ltr, Hq, Twelfth Army Gp, APO 655, 5 Feb 45, subj: "Inf Cn Co"
34. Ltr, Hq, 3d Inf Div, 17 Oct 45, subj: "Suggested Changes in T/O & E, 10-7"
35. Army Ground Force, Report No. 959, WD Obsr Bd, 22 May 45, "Div QM in Combat"
36. Ltr, Hq, 3d Inf Div, 10 Oct 45, subj: "Overstrength of the Div Sig Co"
37. Ltr, WD, file AG 322 OB-I-GNGCT-M, 26 Mar 45, subj: "Activation, Reorganization and Augmentation of Divisional, Corps and Army Units"
38. After Action Report, 1st U.S. Inf Div
39. After Action Report, 2d U.S. Inf Div
40. After Action Report, 9th U.S. Inf Div
41. After Action Report, 29th U.S. Inf Div
42. After Action Report, 79th U.S. Inf Div
43. After Action Report, 2d U.S. Armd Div

44. Army Ground Force, Report No. 196, WD Obsr Bd, 27 Aug 44, "Proper Weapon for Inf Cn Co"
45. Ltr, Hq, USFET, to the AGO, WD, file AG 322 OPGC, 15 Feb 45, subj: "The Inf Cn Co"
46. Army Ground Force, Report No. 333, WD Obsr Bd, 26 Oct 1944, "Attack of Siegfried Line"
47. Army Ground Force, Report No. 794, WD Obsr Bd, 5 Apr 45, "Weapons"
48. Army Ground Force, Report No. 234, WD Obsr Bd, 20 Sept 1944, "81mm Mortar"
49. Third U.S. Army Artillery Conference, Bad Wiessee, Germany, 30 May - 1 Jun 45
50. Seventh U.S. Army Artillery Conference, Augsburg, Germany, 9-10 Jun 45
51. Army Ground Force, Report No. 921, WD Obsr Bd, 7 May 45, "T/O"
52. Army Ground Force, Report No. 1088, WD Obsr Bd, 4 Jul 45, "Tactics and T/O, Inf Div"
53. Ltr, SHAEF, G-3 Div, (Fwd), 12 Jul 45, subj: "Army Ground Force Equipment Review Board, Preliminary Board Study"
54. Ltr, Hq, USFET, 28 Aug 45, subj: "Changes in Tables of Orgn and Equip of TD Bns"
55. Ltr, Hq, Twelfth Army Gp, APO 655, 7 Jun 45, subj: "Army Ground Force, Equip Review Board, Preliminary Study"
56. Report of Medical Section, The General Board, USFET, 21 Nov 45, subj: "Proposed Medical Pers for the Proposed Inf Div"
57. Twelfth Army Gp, G-3 Sec Report of Operations
58. Third U.S. Army Report of Operations, Vols I - II
59. First U.S. Army Report of Operations, 20 Oct 43 - 1 Aug 44
60. Twelfth Army Gp, Air Effects Committee, "Effect of Air Power on Military Operations, Western Europe"

\* The term "Bazooka" as used in this report refers to rocket launcher.

THE GENERAL BOARD  
UNITED STATES FORCES, EUROPEAN THEATER  
APO 408

R 320.2/9 TGBSY

2 November 1945

STUDY DIRECTIVE NUMBER 19. - REVISED COPY -

TO : Assistant Chief of Staff, G-3.

SUBJECT: Organization, Equipment, and Tactical Employment of the Infantry Division.

1. Mission.-- Prepare detailed report and recommendations on the organization, equipment, and tactical employment of the Infantry Division.

2. Scope.-- Report and recommendations will include consideration of the following:

a. Organization.

- (1) The composition of the Infantry Division to include proportion of Infantry, Artillery, Tank, Engineer, Signal, Cavalry, and other arms and service units desired.

(Note - Elements should be shown in sufficient detail to indicate size and purpose down to and including units of company size.)

- (2) Analysis of the infantry regiment to determine the suitability and adequacy of small arms, arms of larger caliber, such as anti-tank weapons and the infantry cannon and the need for their replacement by other weapons; an evaluation of the recoilless weapon and its suitability to replace present authorized infantry armament; discussion of the need for tanks and/or tank destroyers.

b. Equipment.

- (1) Major items of equipment which should be included in each unit of the division.
- (2) Recommendations as to what modifications, if any, are desired for present major items.

c. Tactical Employment.

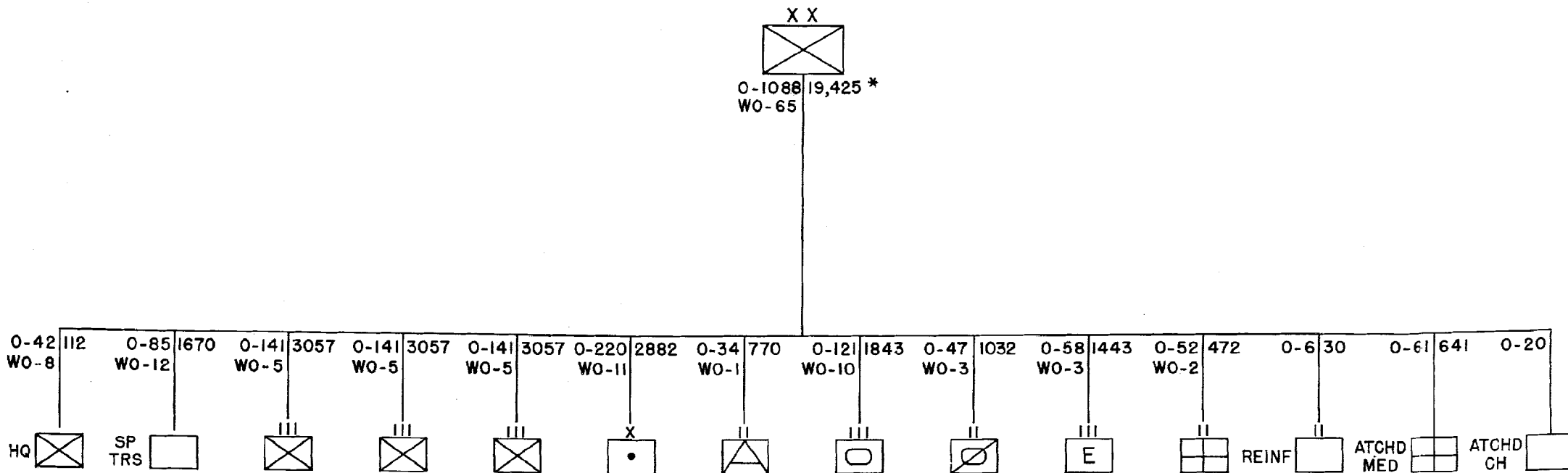
- (1) Role of Infantry Division in Offensive Operations.
- (2) Role in Defensive Operations.

3. Instructions.-- See Plan of Operations, The General Board.

FOR THE PRESIDENT OF THE BOARD:

/s/ C. R. Landon  
/t/ C. R. LANDON  
Colonel, AGD,  
Secretary.

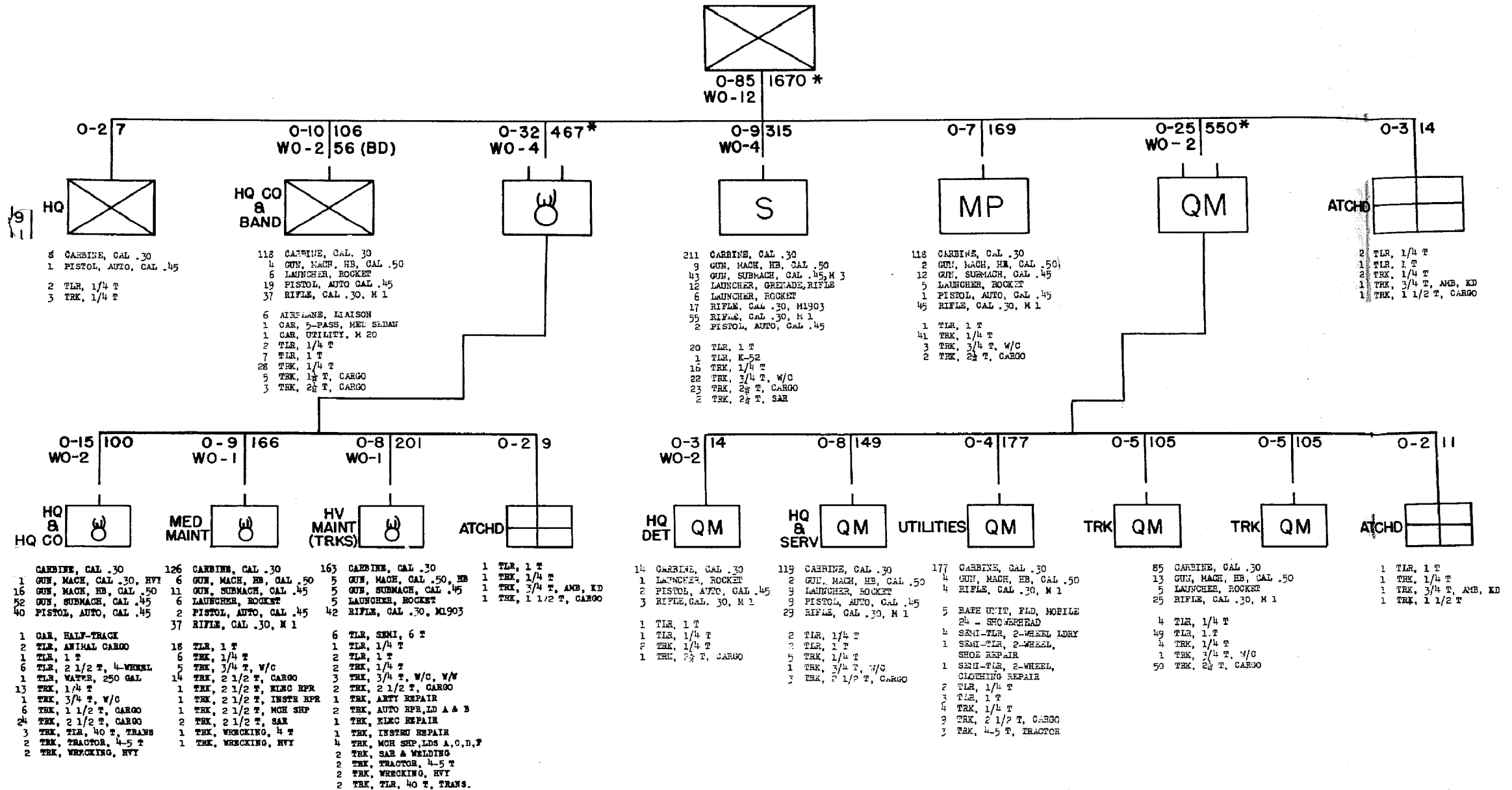
# THE INFANTRY DIVISION



\* DOES NOT INCLUDE ATTACHED  
MEDICAL & CHAPLAIN PERSONNEL

# SPECIAL TROOPS

DEC 1, 1945

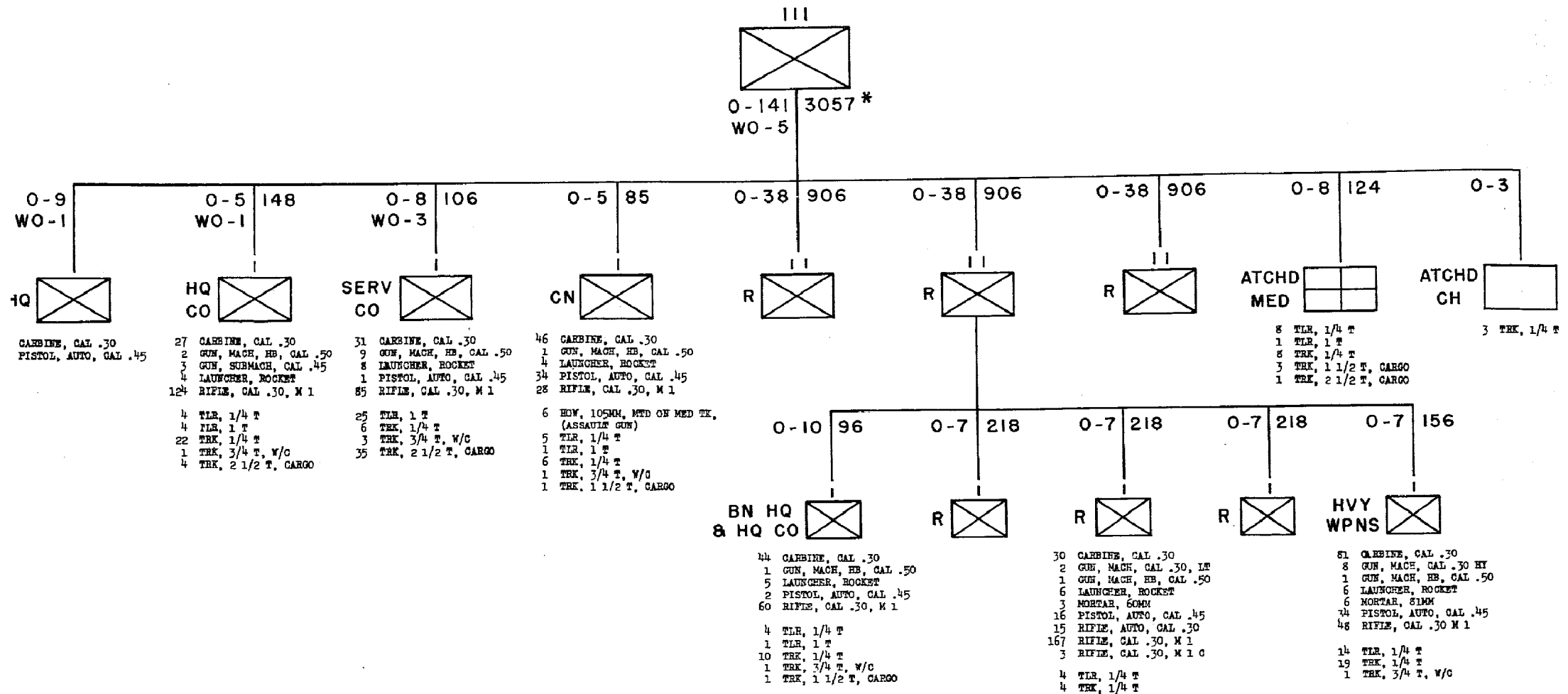


\* DOES NOT INCLUDE ATTACHED  
MEDICAL PERSONNEL

APPENDIX 3

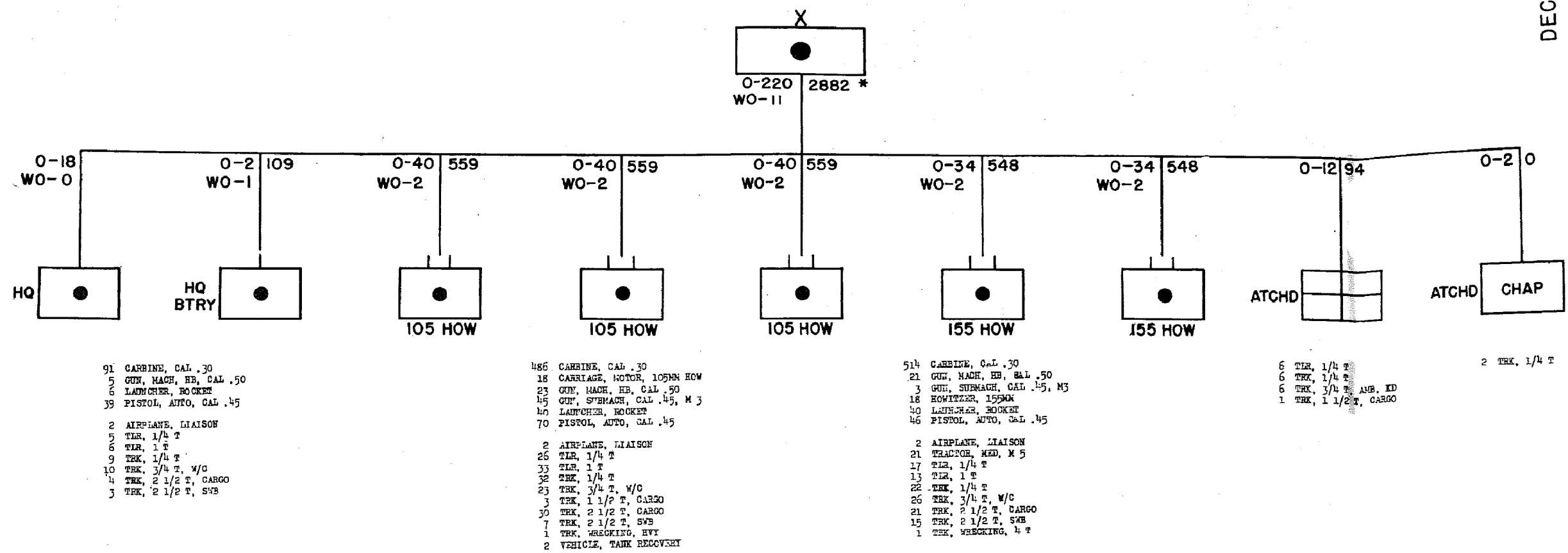
# INFANTRY REGIMENT

DEC 1, 1945



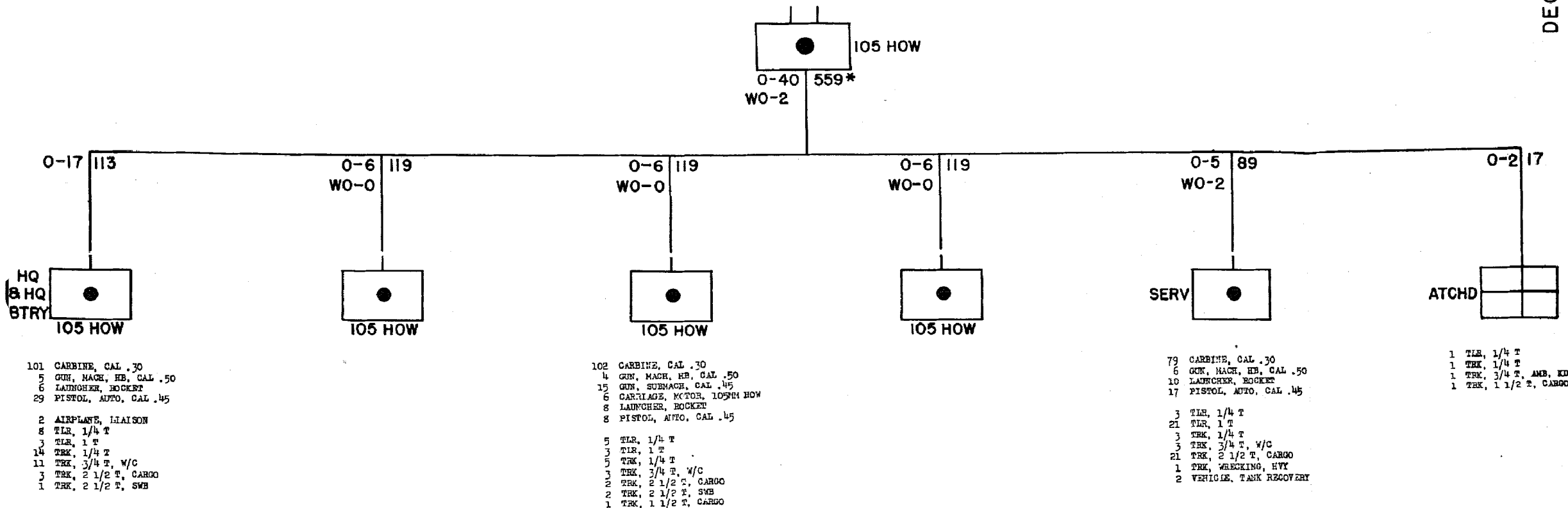
\* DOES NOT INCLUDE ATTACHED MEDICAL & CHAPLAIN PERSONNEL

DIVISION ARTILLERY



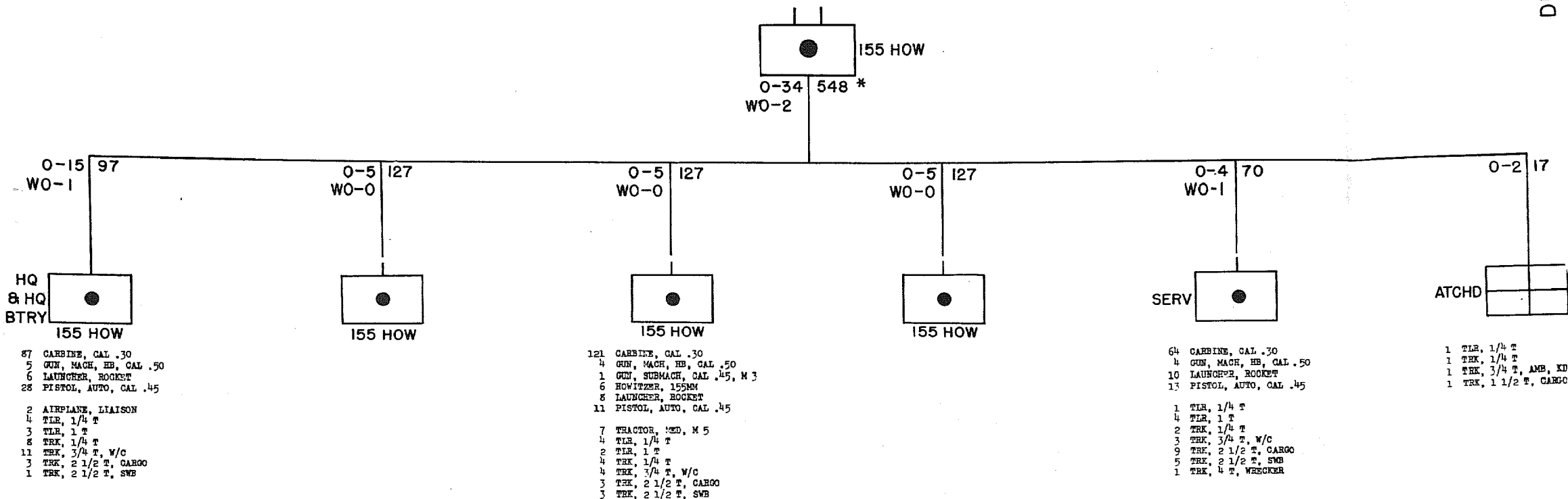
\* DOES NOT INCLUDE ATTACHED MEDICAL AND CHAPLAIN PERSONNEL

# 105 HOWITZER



\* DOES NOT INCLUDE ATTACHED  
MEDICAL PERSONNEL

# 155 HOWITZER

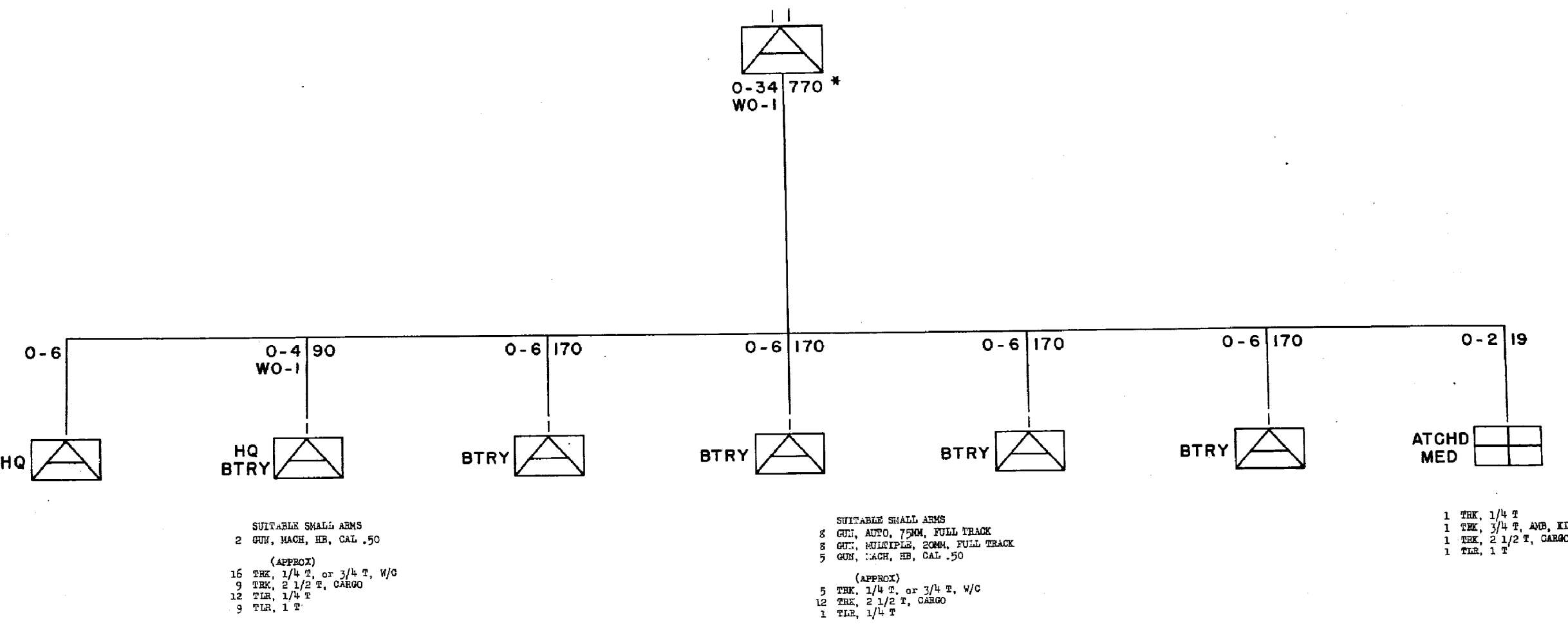


(TOWED, PENDING DEVELOPMENT  
OF SELF-PROPELLED MOUNTS)

DOES NOT INCLUDE ATTACHED  
MEDICAL PERSONNEL

ANTI-AIRCRAFT AW BATTALION (MOBILE)

DEC 1, 1945

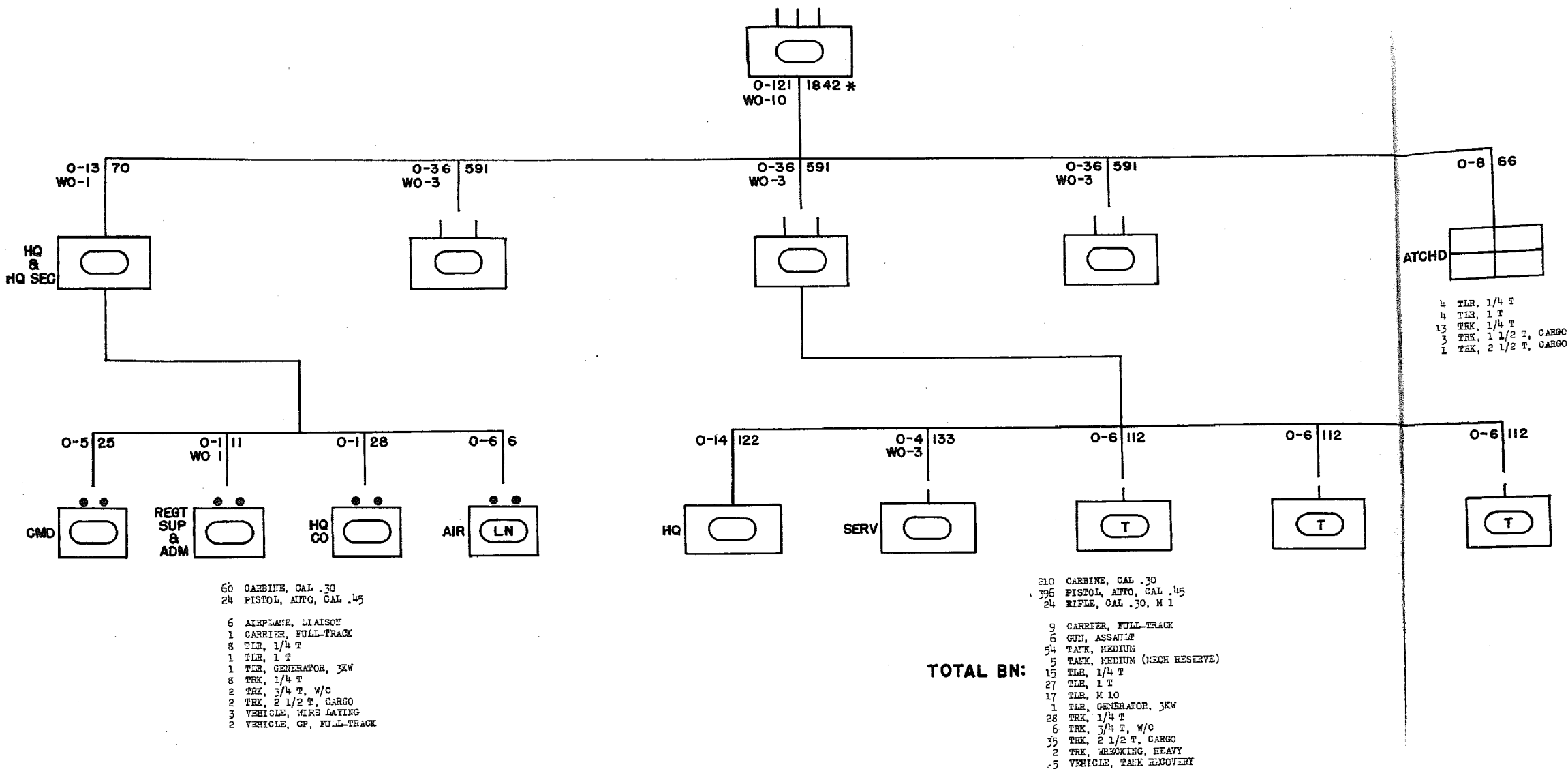


\* DOES NOT INCLUDE ATTACHED MEDICAL PERSONNEL.

# TANK REGIMENT

DEC 1, 1945

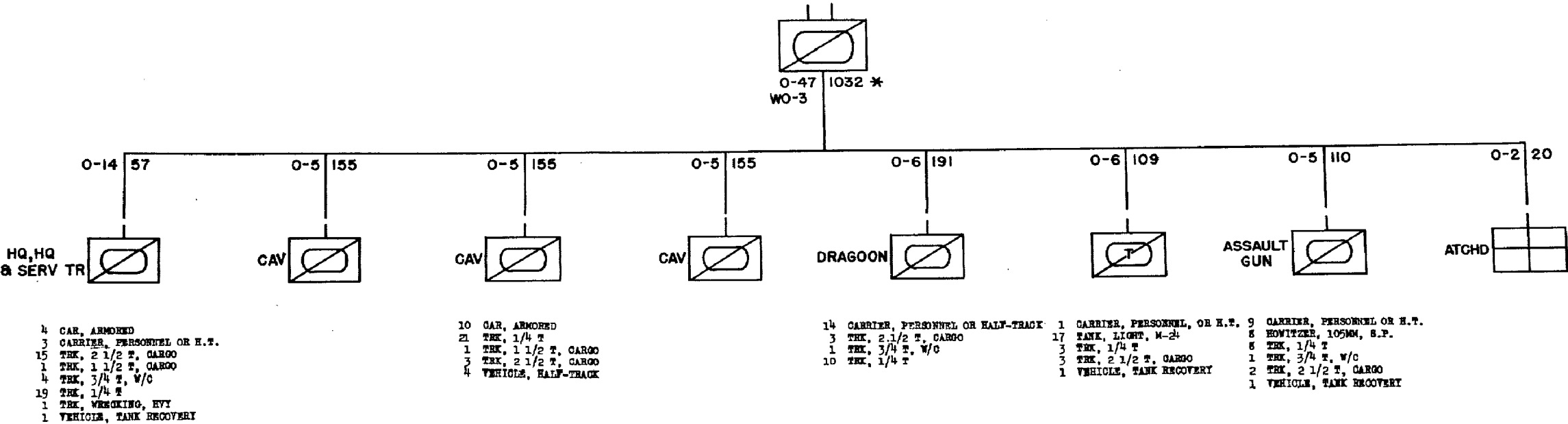
APPENDIX 9



TOTAL BN:

\* DOES NOT INCLUDE ATTACHED  
MEDICAL PERSONNEL.

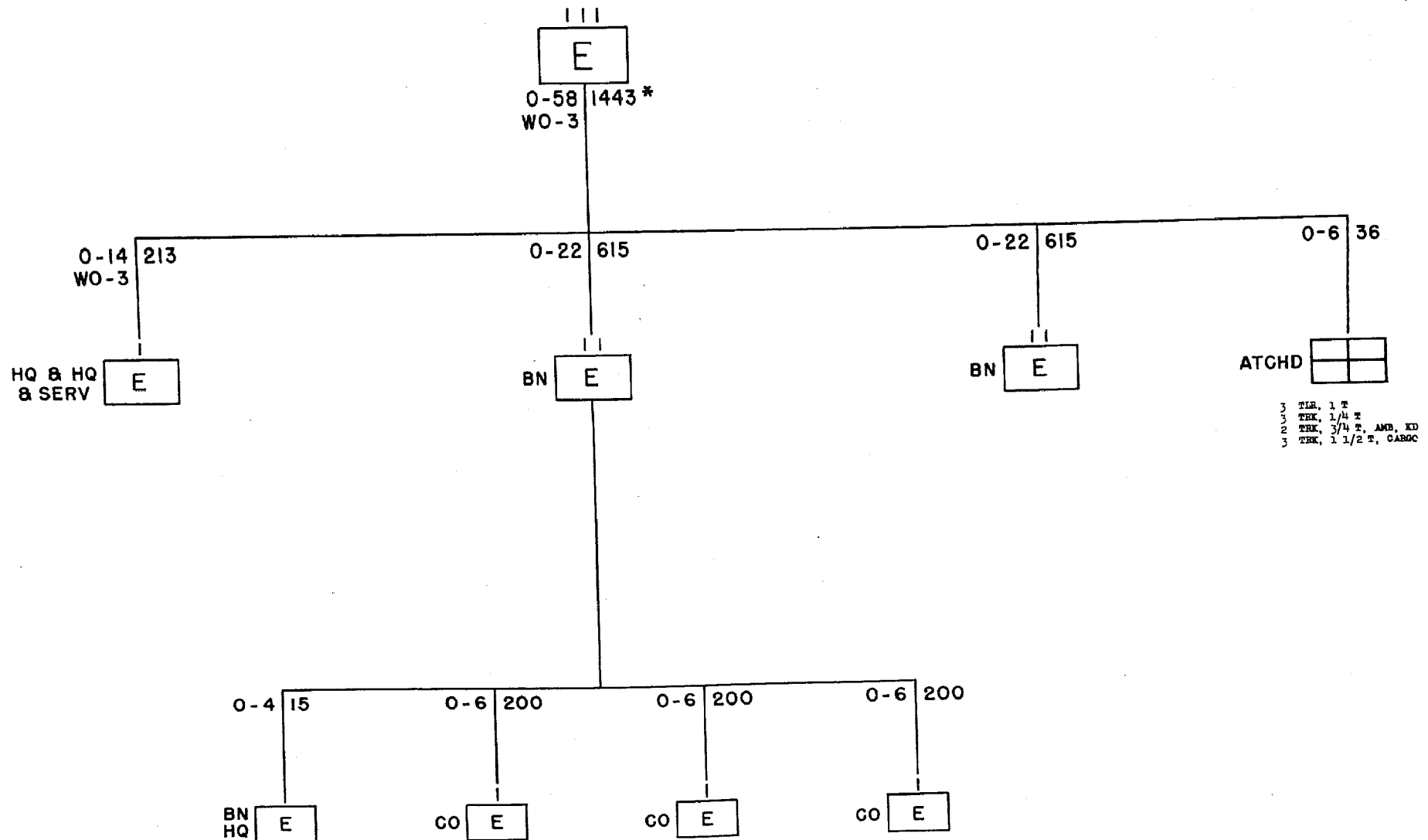
MECHANIZED CAVALRY SQUADRON



\* DOES NOT INCLUDE ATTACHED  
MEDICAL PERSONNEL

# ENGINEER REGIMENT

DEC 1, 1945



3 TLR, 1 T  
3 TRK, 1 1/4 T  
2 TRK, 3/4 T, AMB, ED  
3 TRK, 1 1/2 T, CARGO

## WEAPONS

131 CARBINE, CAL .30  
36 GUN, MACH, CAL .30, HVY  
8 GUN, MACH, CAL .30, LT  
31 GUN, MACH, HB, CAL .50  
83 GUN, SUBMACH, CAL .45  
8 GUN, 37MM  
60 LAUNCHER, ROCKET  
7 PISTOL, AUTO, CAL .45  
1303 RIFLE, CAL .30, M 1

## VEHICLES

8 CAR, ARMORED, LT, M 8  
51 TRK, 1 1/4 T  
28 TRK, 3/4 T, W/C  
50 TRK, 2 1/2 T, CARGO  
54 TRK, 2 1/2 T, DUMP  
8 TRK, 6 T, PRIME MOVER  
3 TRK, 6 T, BRIDGE  
2 TRK, 10 T, WRECKER  
39 TLR, 1 1/4 T  
48 TLR, 1 T

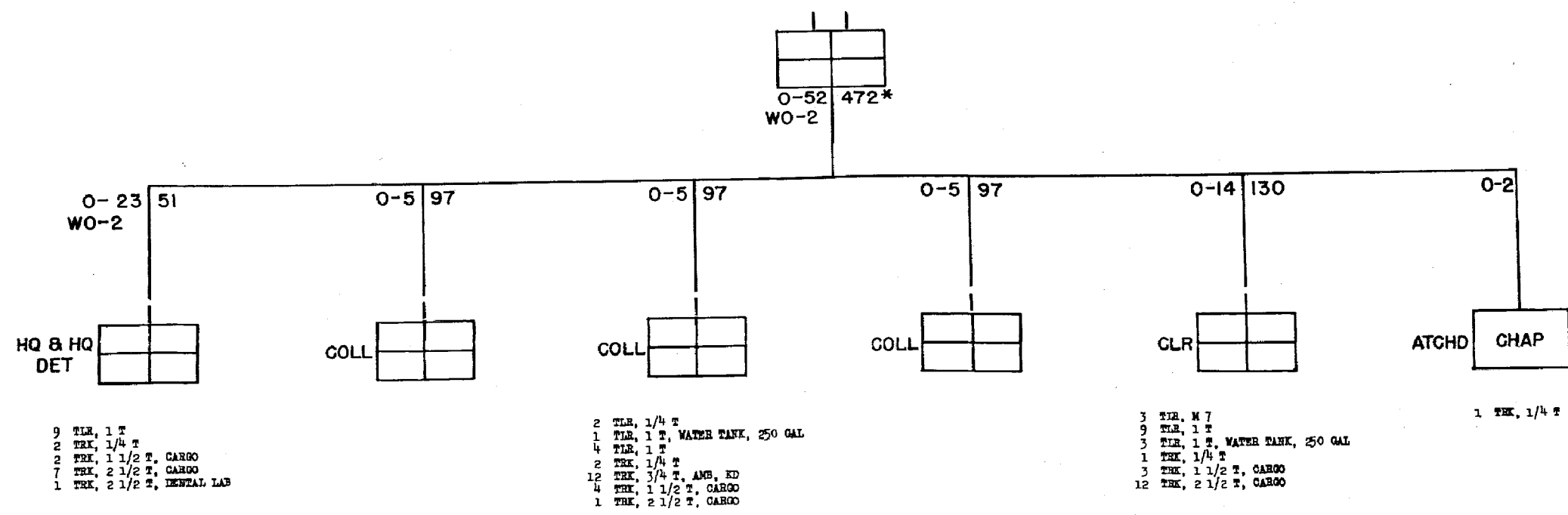
## SPECIAL EQUIPMENT

108 ft BRIDGE, M 2, DRY TREADWAY  
8 COMPRESSOR, AIR, TRK MOUNTED  
3 CRANE, TRK MOUNTED, GSD, 3/4 YD  
2 GRADER, MTZ, BED, 12' MOLDBOARD  
8 SEMI-TLR, LOW B&D, 20 T  
1 SHOP EQUIP, MTZ, GENERAL PURPOSE REPAIR  
4 TANK, ENGINEER  
8 TRACTOR, DIESEL, 70 to 90 DEHP  
2 TLR, UTILITY, POLE TYPE, 2 1/2 T, TYPE I  
20 WATER PURIFICATION EQUIP, SET 3  
2 WELDING EQUIP, SET 1, ALSO ARC, TLR MOUNTED

\*DOES NOT INCLUDE ATTACHED  
MEDICAL PERSONNEL

APPENDIX II

# MEDICAL BATTALION



\* DOES NOT INCLUDE ATTACHED  
CHAPLAIN PERSONNEL

## THE GENERAL BOARD

United States Forces, European Theater

## SUMMARY OF ANSWERS TO QUESTIONNAIRE - "THE INFANTRY DIVISION"

QUESTIONNAIRE (Some of important questions included on questionnaire)	MAJOR GENERALS (INCLUDES 1 LT GEN)		BRIGADIER GENERALS		COLONELS		LT COLONELS & MAJORS		COMBINED TOTALS	
	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO
1. Should position of Asst Div Comdr be eliminated?	3	13	4	4	8	18	0	12	15	47
2. What should be ranks of Div General Staff?	9 - Lt Col 2 - Col 5 - G-3 Col		6 - Lt Col 2 - G-3 Col 2 - G-4 Col		14 - Lt Col 10 - G-3 Col 2 - G-4 Col		7 - Lt Col 5 - G-3 Col		36 - Lt Col 19 - G-3 Col 4 - G-4 Col 2 - Col	
3. What size armored units should be organic in the Inf Div?	7 - Tk Bn 4 - Tk Regt 2 - Tk Bn/Co ea R 3 - Tk Bn ea Regt		5 - One Tk Bn 1 - Two Tk Bns 1 - Tk Co ea R 1 - Tk Bn ea R		6 - Tk Bn 11 - Tk Regt 7 - Tk Bn/Co ea R 1 - Tk Co ea R		5 - One Tk Bn 5 - One Tk Regt 2 - Tk Co ea Regt 1 - Tk Bn/Co ea R		21 - Tk Co ea Regt 20 - Tk Regt 10 - Tk Bn/Co ea R 4 - Tk Bn ea R	
4. Should Cannon Co be eliminated from Inf Regt?	10	5	4	4	9	14	5	8	24	31
5. Should the 4.2" Oml Mortar replace the 81mm Mortar in Div Wpn Co?	3	12	1	6	2	20	4	9	10	47
6. Should a 4.2" Oml Mor Co be organic in Inf Regt?	9	6	5	2	17	6	10	3	41	17
7. Should an AAA Bn be organic in the Inf Div?	12	4	7	1	21	2	9	4	49	11
8. Should a Tank Destroyer Bn (SP) be organic in the Inf Div?	9	6	7	1	16	10	10	3	42	20
9. Should a Tk or TD Co (SP) be substituted for the AT Co in Regts?	9 (6 - Tk Co) (3 - TD Co)	6 (3 - Tk Co)	3 (3 - Tk Co)	4 (3 - Tk Co)	20 (17 - Tk Co) (3 - TD Co)	4 (3 - Tk Co)	10 (6 - Tk Co) (4 - TD Co)	3 (3 - Tk Co)	48 (32 - Tk Co) (16 - TD Co)	17 (17 - Tk Co)
10. What should be the size of Div Military Police unit?	15 - Co		7 - Co		19 - Co 1 - Bn		6 - Co 2 - Bn		47 - Co 3 - Bn	
11. Should organic transportation be assigned to motorize the entire Div?	1	13	2	6	5	13	1	8	9	40
12. Should a Cavalry Squadron be substituted for Div Recon Troop?	6	10	3	3	11	12	4	8	24	33
13. Should a QM Shower Unit be organic in the Inf Div?	9	7	4	3	24	2	12	1	49	13
14. Should a Defense (WP) Platoon be organic in the Inf Regt?	12	4	7	0	19	6	9	4	47	14
15. Should each Inf Regt be authorized a Band?	9	6	5	3	20	6	9	4	43	19
16. What should be the strength of the Rifle squad?	10 - 12 Men 2 - 13 Men		4 - 12 Men 1 - 14 Men 1 - 15 Men		13 - 12 Men 5 - 13 Men 2 - 14 Men		8 - 12 Men 2 - 13 Men		35 - 12 Men 10 - 13 Men 2 - 14 Men	
17. Should the rank of the Div Army and Inf Regt CO's be the same? What?	10 (7 - S.O.) (3 - Col.)	6 (3 - S.O.)	4 (2 - S.O.) (2 - Col.)	2 (2 - S.O.)	21 (13 - S.O.) (7 - Col.)	4 (3 - S.O.)	9 (4 - S.O.) (5 - Col.)	4 (4 - S.O.)	44 (26 - S.O.) (17 - Col.)	16 (16 - S.O.)
18. Should LMG be substituted for BAR in the Rifle squad?	3	9	0	6	2	21	3	9	8	45
19. Do you recommend any changes in the tactical role of Inf Div?	0	14	0	6	0	23	0	11	0	54

THE GENERAL BOARD  
UNITED STATES FORCES, EUROPEAN THEATER  
Office of the Antiaircraft Officer  
APO 408

31 October 1945

SUBJECT: Antiaircraft Artillery with the Infantry Division.

TO : Chief of G-3 Section, The General Board, United States Forces,  
European Theater, APO 408, U. S. Army.

1. After careful study, the Antiaircraft Section has come to the conclusion that the normal attachment of one Antiaircraft automatic weapons battalion to the infantry division is faulty, and that instead there should be a two-battalion regiment assigned organically to the division for the following reasons:

a. The scale of Antiaircraft allotment to the infantry divisions in this theater was generally sufficient only because the Allies held air superiority throughout the entire invasion of at least seven to one. Even so, many senior commanders felt that Antiaircraft protection provided by one automatic weapons battalion was inadequate.

b. Jet-propelled aircraft and flying bombs with greatly increased speeds over normal aircraft will require more Antiaircraft weapons for an area defense, which is recognized as normal.

c. The probability of an increase in the amount of field artillery in the proposed infantry division. (Protection of divisional field artillery has always been the Antiaircraft's number one priority.)

2. Studies of this section indicate that the present group-battalion organization for Antiaircraft Artillery should be changed, and recommendation is being submitted calling for two battalions of four batteries each--one a gun regiment armed with 90mm, fully-radared guns, the other an automatic weapons regiment with a new 75mm fully-radared automatic gun. These 75's are supported by new quadruple-mounted 20mm guns which replace the quadruple-mounted caliber 50 machine guns.

3. Attached hereto is a discussion elaborating on the subject, as well as a rough picture of the proposed Antiaircraft automatic weapons regiment, which, as mentioned above, would be a standard unit throughout the Antiaircraft Artillery.

/s/ Clare H. Armstrong  
/t/ CLARE H. ARMSTRONG  
Brigadier General, U.S.A.  
Antiaircraft Officer

2 Incls.

Incl 1. AAA with the Inf Div

Incl 2. Proposed AAA AW Regt

ANTI-AIRCRAFT ARTILLERY IN THE INFANTRY DIVISION1. Historical Annotation.

a. It is common knowledge that our European Campaign was fought against an enemy which could not be rated as being above that of a third-rate adversary in the air. Our own Air Force had liquidated it by an estimated 70 percent before D-Day. Therefore, a study of anti-aircraft artillery activities in this campaign can hardly be used as a yardstick in arriving at definite conclusions for allocation of anti-aircraft artillery units in the army of the future. It is not considered unsound to feel that at the beginning of another war, our enemy would have parity with us in the air, if not superiority.

b. In many minds it is believed that an automatic weapons battalion of 40mm Bofors guns proved to be adequate for divisional defense in this war. A review of the written testimony of some eighteen anti-aircraft artillery battalion commanders who were attached to and supported infantry divisions in the European Theater, however, discloses that the majority of them state they often needed more anti-aircraft artillery fire power in combat and recommended that additional anti-aircraft artillery protection for a division be provided, especially when it was expected of them to be ready to fire ground missions on call, as well as give the division adequate anti-aircraft artillery coverage at all times. Furthermore, it cannot be overlooked that anti-aircraft protection is a constant 24-hour-a-day, seven-days-a-week job. The division goes into a rest area after heavy action to rehabilitate. Not so the anti-aircraft artillery. It has to continue protection of the division even in the rest area. Most of our front line anti-aircraft artillery units were exhausted in this war. Had the war continued longer and had the air threat been greater, it is believed that most front line anti-aircraft artillery personnel would have broken under the strain. Had there been two battalions in the infantry division, a system of rotation of duties could have been arranged so that personnel and equipment could have been better preserved without sacrificing the adequacy of anti-aircraft artillery protection of the division.

2. Air Threat of the Future.

a. Jet-propelled aircraft made their appearance in the last six months of this war. It is not believed amiss to feel that their development will progress and that planes with much greater speed than we know now will make their appearance in the future. The only way for relatively slow-moving ground weapons (comparing anti-aircraft artillery fire power with high-speed jet-propelled aircraft) to effectively meet terrifically high-speed air targets is to increase their defense so that a wider area of mass fire is brought to bear on the attacking aircraft. This can only be done by increasing the size and numbers of the anti-aircraft artillery commitments made in World War II. Very few enemy jet-propelled aircraft were shot down in this war. Had there been more anti-aircraft artillery weapons available, it is safe to conjecture that increased "kills" against them would have been made.

b. Pilotless aircraft (buzz bombs) and V-2 rockets became well-developed and used in this war. All nations will further their development with an eye to higher speeds and more accuracy. Though they were used mainly against rear area targets in this war, with

## ANTI-AIRCRAFT ARTILLERY IN THE INFANTRY DIVISION (Continued)

increased accuracy, they will probably be used more frequently against front line units in a war of the future. The only known defense against them is to increase our anti-aircraft firepower and numbers of weapons.

### 3. Concept of the Division.

a. The basic concept of the division requires that it be self-sufficient at all times. To maintain this self-sufficiency, it must have available constantly means for its own defense against any threat which may normally be expected and which cannot be anticipated in time to obtain the necessary defensive weapons from a source outside of the division. With the trend towards higher-speed aircraft, this threat from the air is a major one, especially against divisions in an attack. A division, therefore, must be ready at all times to protect itself from any air attack. Even in World War II, with a depleted air force attacking us, there are factual data to prove that on certain occasions we did not provide divisions with enough anti-aircraft artillery protection, especially at the time when some anti-aircraft artillery weapons were diverted for ground actions.

### 4. Anti-aircraft Artillery Tactics.

a. In a division, the major mission of anti-aircraft artillery units is to furnish protection for the field artillery. The General Board, it is understood, is going to recommend that an additional battalion of medium field artillery be attached to the division. That means that each infantry division will have two battalions of medium artillery and three battalions of light artillery, a total of five battalions. There are only four batteries of automatic weapons in an anti-aircraft battalion, so they would have to spread out too thin to be tactically sound in order to protect those battalions. Such things as bridges, ammunition dumps, depots, main supply routes, division CPs, potential ground missions, and protection of bivouacs and moving columns on the road would have to go by default if the division only had one anti-aircraft artillery battalion organically with it.

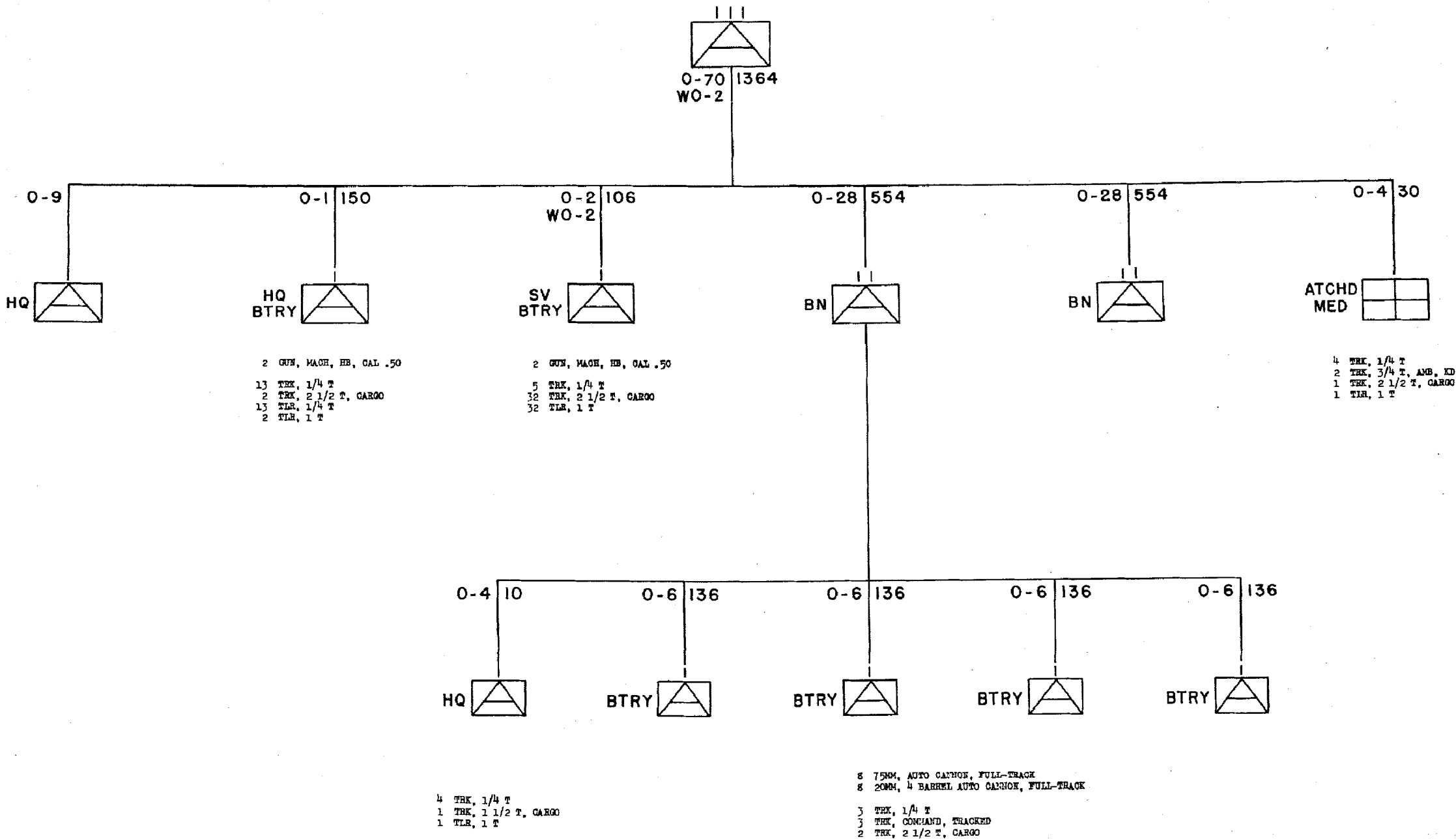
b. Actual experience in the Ninth United States Army over an eight-month period and similar usage in the Italian Theater proved that "area defense" of divisional areas was most sound and provided maximum protection as well as maximum economy in employing anti-aircraft artillery automatic weapons. In this system, several anti-aircraft artillery weapons were spotted approximately in each 1,000 meter square on the map and then so emplaced, terrain permitting, on the ground. The great value of this defense lay in the fact that anti-aircraft artillery guns stayed emplaced and the men at their guns while divisional elements moved around in the divisional area at will. In other than area defense, the protecting anti-aircraft artillery units had to move each time the element they were protecting moved. Since field artillery has to constantly shift around to mass its fire or get in range of new targets, anti-aircraft artillery weapons were continuously on the move and provided little accurate firepower during the moves. Another value of area defense was that regardless of the evasive tactics of attacking enemy aircraft, uniform fire was brought to bear on the targets from all over the division area as long as the enemy aircraft maneuvered over the area. And still another point in favor of area defense was that field artillery and other vital targets were not disclosed to ground observers when attacking aircraft were fired on. When anti-aircraft artillery guns

circled a defended area, they threw up a mass of fire which disclosed to all observers the location of the vital areas. In area defense, anti-aircraft artillery fire was uniform over the whole area and gave away no particular location. One battalion of anti-aircraft artillery automatic weapons in a division was inadequate to give sufficient coordinated protection with this area defense system, even if the division sector was small. Much of the division area was left unprotected with only one battalion available.

5. Proposed Anti-aircraft Artillery Automatic Weapons of the Future. It is the proposal of the Anti-aircraft Artillery Section of The General Board that the automatic weapons of the future be a 75mm automatic cannon, radar-directed and mounted on a full-track, self-propelled armored vehicle, and a quadruple 20mm mount on another full-track, self-propelled armored vehicle. We recommend that there be 32 of the 75mm weapons and 32 of the 20mm weapons in each battalion. The present automatic weapons battalion has 32 towed 40mm Bofors guns and 32 quadruple 50 cal machine guns on a towed vehicle. It can be readily seen how greatly the fire power of these new weapons, their self-propelled mobility, and their armored protection will increase the effectiveness of automatic weapons units against both air and ground targets.

6. Proposed Anti-aircraft Artillery Unit of the Future. The present "fly-by-night" group-battalion set-up has not been satisfactory. The anti-aircraft artillery battalion, as a unit, however, has proven itself in combat. Therefore, to preserve much of the flexibility of the present organizations and yet give the battalions a sense of permanency, and the anti-aircraft artillery unit more self-sufficiency and stability, we recommend a two-battalion, four battery per battalion, regiment as a standard unit throughout the Army. Its size would be approximately 1,500 men and officers. We based our study, of course, on the needs of a division for anti-aircraft artillery protection against air weapons of the present day and those to be expected in the future. It is our unqualified belief that one battalion of anti-aircraft artillery automatic weapons will be insufficient for an infantry division against a high-speed enemy air power equal to or greater than our air force. The Armored Section of The General Board readily approved of this new all-purpose, hard-hitting regiment for the proposed armored division. We believe that the infantry division of the future will need a two-battalion automatic weapons regiment fully as much as the armored division. We recommend unqualifyingly that this anti-aircraft artillery regiment be made an organic part of the division. The tremendous fire power against both air and ground targets of this proposed anti-aircraft artillery automatic weapons regiment, its stability and its relatively small size are important factors which should be given sober and careful consideration before deciding against it and considering it as being too large an anti-aircraft artillery unit for the infantry division of the future. (See attached chart for diagram of proposed anti-aircraft artillery automatic weapons regiment.)

ANTI - AIRCRAFT AW REGIMENT



THE GENERAL BOARD  
UNITED STATES FORCES, EUROPEAN THEATER  
APO 408

CONFERENCE  
ON  
THE INFANTRY DIVISION

Grand Hotel, Bad Nauheim, Germany, 20 November 1945.

MINUTES

OF

CONFERENCE ON THE INFANTRY DIVISION

Grand Hotel, Bad Nauheim, Germany, 20 November 1945

OFFICERS PRESENT

General G. S. PATTON, JR.  
Lieutenant General G. KEYES  
Major General L. C. ALLEN  
Major General H. R. GAY  
Major General E. S. HUGHES  
Major General H. L. MCBRIDE  
Major General W. M. ROBERTSON  
Brigadier General C. H. ARMSTRONG  
Brigadier General J. D. BALMER  
Brigadier General G. H. DAVIDSON  
Brigadier General J. A. HOLLY  
Brigadier General R. G. MOSES  
Brigadier General C. E. RYAN  
Colonel W. S. BIDDLE  
Colonel R. O. FORD  
Colonel B. FURUHOLMEN  
Colonel L. H. GINN, JR.  
Colonel J. A. HEINTGES  
Colonel J. C. MACDONALD  
Colonel T. H. MADDOCKS  
Colonel H. B. MARGESON  
Colonel E. H. MCDANIEL  
Colonel L. C. MCGARR  
Colonel I. M. OSETH  
Colonel C. T. SCHMIDT  
Colonel T. A. SEELY  
Colonel G. W. VAN WAY, JR.  
Lieutenant Colonel S. G. BROWN, JR.  
Lieutenant Colonel J. G. FELBER  
Lieutenant Colonel J. A. LEWIS  
Lieutenant Colonel J. H. MONTGOMERY, JR.  
Lieutenant Colonel I. B. RICHARDS, JR.  
Chaplain (Captain) G. G. FINLAY

COMMITTEE MEMBERS

Brigadier General A. F. KIBLER  
Colonel D. J. BAILEY  
Colonel T. A. BROOM  
Colonel S. G. CONLEY  
Colonel H. H. CRITZ  
Lieutenant Colonel E. G. BEVAN  
Lieutenant Colonel F. H. CANTRELL  
Lieutenant Colonel W. R. CHEVES  
Lieutenant Colonel S. G. FRIES  
Lieutenant Colonel H. B. ST. CLAIR  
Lieutenant Colonel E. J. WHITELEY

MINUTES OF THE INFANTRY DIVISION CONFERENCE  
Conference opened at 0930.

Gen PATTON:

When we asked you gentlemen to attend this conference it was with the expectation that there would be about 15 or 17 visiting members but for various reasons some were unable to attend. However, we still have enough of you, and also of ourselves, to consider the proposed infantry division. It should be pointed out that the infantry division here proposed is not the exclusive product of The General Board. It is an algebraic sum, so to speak, of the ideas of all the numerous people - some hundreds - who have been questioned on the subject.

There are two points that I would like personally to call to your attention. The first one is this: We must figure what we do to the enemy on the basis of what the enemy does to us, remembering that the casualty figures are based on wounded and not dead because we have no way of finding out how the dead were killed. The infantry component of the division, which is 65.9% of the total personnel, inflicts on the enemy by means of small arms, automatic weapons, mortars and hand grenades approximately 37% of the casualties. In order to inflict 37% of the casualties the infantry sustains 92% of the total casualties in the division. The artillery, which comprises 15% of the division, inflicts on the enemy 47% of the total casualties for which it pays but 2%. However, we have to qualify this statement because in practically all divisional operations the division is supported by a large amount of corps and army artillery. In the armored division of which 29% is infantry, 15.4% artillery and 20.5% armor, the infantry casualties amount to 65% of the total casualties of the division. The artillery casualties, totaling 4.7%, little more than double those of the artillery in the infantry division. Tank casualties are 25%. This may or may not indicate whether armor serves infantry. This is one phase of the subject which I arrived at independently. You will notice the proposed organization is pretty heavy in tanks. This organization was arrived at with the data I gave you.

My second point is: Americans as a race are the most adept in the use of machinery of any people on earth and they are the most adept in the construction of machines on a mass production basis. This suggests to my mind the fact that we should exploit to the utmost our ability in the use of mechanical aids both on the ground and in the air. But we must remember that if the next war is delayed, as we hope it will be for several years, perhaps 25, it is probable that very few of the weapons on this chart will be used. So this division on which we are working is only the datum plane from which further developments must be carried on.

Gen KIBLER:

(Gen Kibler gave an orientation on the mission of the committee and explained the procedure used by the committee in arriving at its recommendations. A considerable number of experienced combat leaders were consulted in person; also a written questionnaire was sent out to other combat leaders ranging in rank from lieutenant generals to majors. In addition, full advantage was taken of reference materials available. He stated further that the committee itself was composed of experienced combat personnel.

Gen Kibler then explained the procedure to be followed in conducting the conference. Colonel Conley, who was in immediate charge of the committee, would explain the proposed division in

detail giving the reasons for changes made. Gen Kibler requested that all questions be withheld until Colonel Conley completed his talk at which time the meeting would be open for discussion.)

Col CONLEY:

(Colonel Conley gave a detailed explanation of the organization of the proposed infantry division explaining the reasons for all recommended changes. A large chart on the wall showing the organization of the various units of the division was referred to in outlining the new division. Several other charts were displayed showing comparisons in armament and personnel between the old and proposed divisions.)

### DISCUSSION

(Note: The following is not necessarily a verbatim transcription of what was said by various individuals at the conference. Some discussion was omitted. However, the consensus of the meeting regarding specific questions discussed is correctly shown.)

Gen KIBLER:

Are there any questions to be clarified? We do not want to discuss the pros and cons but want to clear up points that need clarifying.

Gen PATTON:

What reconnaissance, if any, is there in the armored regiment?

Lt Col FRIES:

Just the reconnaissance platoons that they had before, increased by five men in each platoon.

Gen KEYES:

Are the 105's truck-drawn or self-propelled?

Col CONLEY:

Truck-drawn.

Gen McBRIDE:

Is the anti-aircraft artillery self-propelled?

Gen KIBLER:

Yes.

(Conference adjourned for five minutes and reconvened at 10:45.)

Gen KIBLER:

Now I am going to ask specific questions on which I would like your views. Our first one is: Is the heavy machine gun necessary in the heavy weapons company of the infantry battalion?

Col McGARR:

It definitely is, but we need a better one. I do not think we should allow the mobility of that gun to cause us to throw it out. I have seen it used to stop attacks when other things could not be used. Most definitely we should keep it.

Gen PATTON:

Have you ever seen it used to make an attack?

Col McGARR:

Yes, at Anzio. It did wonderful work. Couldn't do it with a light machine gun.

Gen ROBERTSON:

I personally don't agree that the heavy machine gun is necessary as an organic part of the heavy weapons company, particularly in

the attack. I believe we can meet the requirements by carrying heavy machine guns as a part of the organic battalion load in reserve to be employed only in defensive situations. You can put eight machine guns in one truck. In eleven months of operations with the Second Division, I never used a heavy machine gun for overhead fire, so far as I know.

Col HEINTGES:

I concur with Colonel McGarr. The men who operate the weapons prefer the heavy machine gun as the light machine gun barrels burn up too easily. It is capable of more sustained fire. We used it quite often in the attack, even in Sicily and going over the mountains in southern Italy. However, we do need light machine guns when we are making fast moves or going over rough terrain.

Gen KEYES:

The point is: Do you want more supporting fire? If the heavy machine gun is too heavy, you want another weapon. Sometimes the heavy gun is better than the light. As General Patton brought out, we should not wed ourselves to a weapon right now. There will be improvements. I don't know how you can say "yes" or "no" to this question. It depends on where the man is. The smart solution is to equip companies with both types of weapons rather than to choose definitely the light or the heavy.

Gen PATTON:

With the weapons on hand, I agree with General Keyes for adopting both. Money is no object. I wish that war could be less bloody. It costs about \$40,000 for a man to get killed. If we can keep him from getting killed by a few extra dollars, it is a cheap expenditure. I personally am more responsible for the development of the light machine gun than any other person. The tripod on the heavy machine gun does not have sufficient flexibility. If you use lighter material, you can make just as good a tripod. I would like to ask some people who know more - at what ranges were heavy machine guns used?

Col McGARR:

About 200 - 500 yards.

Gen PATTON:

What I was trying to bring out is: The heavy tripod which I think weighs 52 pounds was built for extreme accuracy at these ranges. We could put a heavy machine gun on a lighter tripod, because at that range the light machine gun is accurate enough.

Col OSETH:

Discussing tripods, the present one won't do. The present machine guns are a little bit outmoded. We need a dual purpose machine gun with fire power of the heavy and the mobility of the light in one weapon.

Col McGARR:

We need a liquid type of cooler, and I would like to see it improved to give it sustained fire power.

Gen KIBLER:

We can't do away with the heavy machine gun, but it should be improved. I take it that that is the consensus of this meeting.

(All agreed.)

Now the next point - Can the heavy weapons company be eliminated?

Gen ROBERTSON:

Yes, I think so. Due to wide frontages, it was quite habitual to spread heavy weapons like machine guns very widely. Why not bring up the weapons platoon of the rifle company by adding a couple of light machine guns and do away with the heavy machine gun company entirely? There are very few battalion commanders who would not prefer four rifle companies with a good weapons platoon in each company to the present organization. I would not give my heavy mortars to the rifle company but would keep them in the battalion headquarters company.

Gen KIBLER:

You would assign machine guns down to the rifle company?

Gen ROBERTSON:

I would.

Col HEINTGES:

We should maintain a heavy weapons company and each man should be identified with one weapon only, although he should be familiar with them all.

Gen ROBERTSON:

What percentage of fire power did you develop from your infantry weapons in attacks?

Col McGARR:

We applied our automatic weapons 95 percent of the time, sometimes 100 percent.

Gen ROBERTSON:

I don't believe more than 50 percent to 60 percent of total fire power was used.

Col McGARR:

My answer was based on automatic weapons.

Gen ROBERTSON:

I never failed to be impressed as I went from rear to front, I would see this mass of artillery and tank destroyers and regimental and battalion headquarters. At the front lines a small number of men were carrying the attack. There were about 1100 men in the assault element. They took 90 percent of the casualties. In an infantry division they carry your battle. They are the people who get you forward. We need more of them. I believe in weapons but I also want more infantry. I want a lot more infantry.

Gen KEYES:

The percentage of casualties is very high there. Why not put that extra into weapons or something other than that group?

Gen ROBERTSON:

Because I want them for support and reserve units, which I never had in eleven months of combat. I never had enough to do the job. I think we were wrong in making no provisions for rotating the units in the front line. This was necessary so that we could build up enough depth in the units. We must provide that rotation.

Gen PATTON:

That's a personal view. As an infantry unit is now composed, the riflemen get killed getting the light machine guns and 60mm mor-

Gen PATTON (CONTD):

tars forward which in turn get the artillery forward for fighting. That's the way we fight now. Personally, I'm in favor of trying to find less bloody ways of fighting.

Gen GAY:

Would you recommend another regiment of infantry?

Gen ROBERTSON:

I wouldn't think badly of that.

Gen GAY:

I would go along with that.

Gen ROBERTSON:

Every division commander will tell you the same story. He couldn't rotate his units.

Gen KIBLER:

I believe that the majority is in favor of retaining the heavy weapons company. Do you agree with the retention of the anti-tank company, as now proposed, armed with nine medium tanks, or would you prefer a medium tank company, complete, organic in the infantry regiment in lieu of the anti-tank company?

Col McGARR:

I would like to see the anti-tank weapon improved. It should have lighter armor and more speed, if possible, for the anti-tank mission. I don't believe it is necessary to have a tank company with a regiment. It is better used in a division set-up and can be thrown in where needed.

Gen KIBLER:

Do you want an anti-tank company and medium tanks also?

Col McGARR:

Yes, I want them in place of the 57's at present in the anti-tank company. I would also like to have two battalions of tanks with the division which could be attached to the regiments.

Gen ROBERTSON:

I would prefer three battalions in the division and take both anti-tank and cannon companies out of the regiments. This would provide more sustained power. You have the same number of tanks but under centralized control. My organization would be three tank battalions - no tanks in the regiment - and feed them up as needed.

Gen McBRIDE:

Are we planning an armored or infantry division?

Gen PATTON:

Apropos of General McBride's statement, are we building an armored or infantry division? In my opinion, there is very little difference between them except one very fundamental one. In an infantry division the purpose of supporting weapons - primarily tanks - is to get the infantry forward. In an armored division, the purpose of the infantry is to break the tanks loose.

Gen KIBLER:

How many agree with General Robertson that the anti-tank and cannon companies should be eliminated and replaced by tanks in the division echelon?

Col HEINTGES:

I do not agree with General Robertson. I am a little radical on this, but I have my anti-tank company organized with bazookas and I used it as a bazooka company.

Gen ROBERTSON:

I contemplate the bazooka defense, but I don't think the anti-tank company is necessary.

Gen McBRIDE:

Why have two different tank units - one tank and one anti-tank? Aren't they both the same?

Col McGARR:

Yes, they are the same, but it is better to have mobile guns as anti-tank defense.

(A brief discussion followed.)

Col McGARR:

General Patton is right. We should have something light, like a weasel, upon which we could put our recoilless artillery. There is need for getting close-in support. The answer is lighter vehicles with a recoilless weapon mounted on them, let's keep the assault gun while making the transition.

Gen ROBERTSON:

Why keep the anti-tank company in the infantry regiment pending the development of a heavier weapon to take its place? Just to keep an anti-tank company or cannon company so that we will have a company to place a weapon later is fundamentally wrong. We should never keep a unit intact for use of future development of weapons.

Gen KEYES:

I don't agree, because if you do not retain the organization you will never get your weapon developed. You must visualize that you are going to have it in order for you to plan for personnel requirements. That's where we ran into such a snag on replacements.

Gen KIBLER:

It seems that the majority do not want a tank unit organic in the infantry regiment to replace the anti-tank company. All seem to agree that the best anti-tank weapon today is the medium tank. It therefore seems to be the consensus of this meeting that the anti-tank company should be eliminated from each infantry regiment and three tank companies should be added to the tank regiment at division level. Are there any who dissent from this solution?

(Only one officer dissented.)

That disposes of the anti-tank company. I will now ask the next question. Do you agree with the organization and armament (six assault guns) proposed for the cannon company? If not, what do you recommend?

Gen McBRIDE:

What is the purpose of the assault gun company?

Col CONLEY:

Direct support of the infantry. The cannon company was organized originally to satisfy the desire on the part of the infantry for immediate close support when needed. The artillery battalion in the rear is a fire unit, and it is undesirable to parcel out one battery.

Col CONLEY (CONTD):

In addition they do not like to send a whole battalion to do a little job; also the infantry needs an accompanying gun.

Gen McBRIDE:

Don't you think that goes back to World War I when we were suspicious of artillery support? There is nothing that the cannon company can do that the organic artillery can't do as well.

Gen BALMER:

Yes, it started in the first World War when there was a demand from the front line for accompanying guns. At that particular time we did not have a system of operation and fire-direction that we now have; also it was true that the infantry did not get the support from its artillery that it should have gotten. The cannon company must have an armored vehicle capable of direct fire. Its place is with the infantry. Personally, I believe that you probably need an assault weapon.

Gen ROBERTSON:

If you want direct fire, how about your supporting tanks? You are duplicating yourself as it is now.

Gen McBRIDE:

Training is one thing, coordination is another. With due respect for the infantry, they can't train cannon companies.

Col McGARR:

We had a superb cannon company. We trained new men that came in. I still think we should have something to fill in the gap for speed when communications give out. We lost a lot of artillery observers and radios.

Gen PATTON:

You lose communication when they get wet at river crossings and landings.

Gen KEYES:

With an increase in tank battalions, can't you then get that immediate support from the tanks that are attached to you?

Col McGARR:

We could if they could get there fast enough.

Gen ROBERTSON:

Is there anything a cannon company can do that a 105mm can't do?

Col McGARR:

Nothing except that it's more timely if the artillery is not functioning, General.

Col HEINTGES:

I want the cannon company.

Gen KIBLER:

How many think we should have a cannon company?

(The majority voted in favor.)

Gen KIBLER:

Is the present assault gun the best weapon we have now?

Col McGARR:

Yes, but we want something better.

Col HEINTGES:

Those little guns could go anyplace I wanted them to go.

Gen KIBLER:

If that weapon is the main weapon, do we need a smaller weapon for river crossings and landings, and what should it be?

Gen McBRIDE:

That jeep-rocket would be ideal. I have only seen it in the movies.

Gen KIBLER:

It seems the majority believes we should retain the cannon company but that it should be equipped with a better weapon. For the present, is the assault gun acceptable?

(The majority agreed.)

Gen KIBLER:

That concludes the cannon company problem.

Conference recessed at 1200 for luncheon.

Conference resumed at 1330.

Gen KIBLER:

As to the tank question, it appears that the majority believes we should have a three-battalion regiment, eliminating the anti-tank company. It is my understanding that is the consensus of the meeting now.

(All agreed.)

Gen KIBLER:

The next question concerns the artillery. Is there any dissention from the proposed artillery set-up, adding one battalion of 155mm howitzers?

Gen PATTON:

How do you want those guns moved, McBride?

Gen McBRIDE:

Light artillery, self-propelled. I want to know one thing that a towed gun can do better than a self-propelled gun?

Gen BALMER:

Pieces that are supporting a division of this type must follow the infantry. They must go places where self-propelled will not go. When you put the infantry across the river you have to have a big bridge to get the heavy stuff across, but you can put the lighter stuff up faster. We have most of the weight on the side of towed artillery. My reasons are these: towed has been able to do everything that is required by the infantry division. You can conceal and dig in the towed piece much easier. The M-7 self-propelled gun will not fire high-angle-fire and is difficult to conceal. The infantry division does not move as far or as fast as the armored division. The organization is the same: three lights and two mediums. Those are the reasons behind it.

Gen McBRIDE:

I don't find many reasons there. How are you going to put infan-

Gen McBRIDE (CONTD):

try across? The artillery can shoot a lot farther across. You don't, outside of a few areas, have to worry about concealment. You can conceal anything in Europe. The only place where towed vehicles are better is on icy roads. I don't see any advantage in the towed weapon.

Gen PATTON:

Another point - and my imagination may be too vivid. In the next war owing to the certainty of the proximity fuze, I do not believe that any gun or any other weapon which sits to fight can be without head cover. I personally questioned the junior officers in the 5th Infantry Division who were unanimously in favor of self-propelled guns.

Gen McBRIDE:

The 4th Division had both. Universally everyone regretted the time they turned in the self-propelled for towed guns.

Col HEINTGES:

I would like one battalion of 105's self-propelled and the rest towed.

Gen KIBLER:

The majority of this meeting seems to favor self-propelled artillery.

Col MACDONALD:

I think that is the answer. I am personally in favor of self-propelled artillery, but I am no authority.

Gen ROBERTSON:

I am on the fence on this question. I want some information on self-propelled. My experience with my own tanks was that on all long moves - 250 miles or so - the tank battalions got through only 50%, but the artillery all got through. The maintenance problem must be licked better than it has been.

Gen PATTON:

We also have a medium maintenance company which we didn't have before.

Gen McBRIDE:

You are adding to the maintenance of the division when you put so many half-tracks on the vehicles.

Gen PATTON:

It isn't an awful lot. How many guns are there?

Gen McBRIDE:

Fifty-four guns in three battalions.

Gen ROBERTSON:

I would be in favor of it myself outside of the maintenance factor.

Gen KEYES:

We must expect development and improvements in maintenance factors.

Gen ROBERTSON:

I would like to raise a further question on the artillery set-up. You put a 155mm battalion in there on the basis that everything that was always used with the division should be organic. Is that correct?

Gen KIBLER:

That is one of the factors considered.

Gen ROBERTSON:

Actually I don't think I can remember the time when I didn't have two additional battalions of 155's supporting me from corps. Why shouldn't we have three battalions of 155's?

Gen PATTON:

There is another argument which is very revolutionary and I only bring it forward to give another viewpoint. Owing to the very low casualties in artillery in comparison with infantry, I am not sure there should be any artillery in the infantry division - certainly not mediums.

Gen KIBLER:

The majority opinion of the committee seems to favor the one extra battalion of 155mm howitzers. Is there anybody here who feels we should have more artillery?

(All were satisfied.)

Gen KEYES:

I would like to hear from the experts why the 155mm howitzer should not also be self-propelled. Aren't the advantages the same? Most of General McBride's discussion simply answered the objections to the towed. What are the advantages of having self-propelled 155mm howitzers?

Gen GAY:

How about the ability to fire?

Gen McBRIDE:

That's exactly the case. We don't know anything about it. I think it would be heavier than the 105.

Lt Col BROWN:

The 105 is limited to 45-degree elevation. I don't know about the 155.

Gen PATTON:

The 155 can have the same elevation.

Gen GAY:

Our problem is to recommend a proposed infantry division based on experience in this theater. No one of us has had any experience with 155mm howitzers, self-propelled.

Gen KEYES:

Do we want self-propelled artillery as a result of experience?

Gen KIBLER:

We have had no experience with self-propelled 155's.

Gen PATTON:

I recommend that if the ballistic quality of the 155mm howitzer self-propelled gun is not inferior to the towed 155 howitzer, then it should be adopted.

(All agreed.)

Gen PATTON:

What is the number of guns in a battery of 155's?

Gen BALMER:

Four. Self-propelled would be six.

Gen McBRIDE:

Why not have six towed pieces?

Gen BALMER:

Most people would rather have four pieces towed than six pieces self-propelled.

(Some discussion followed.)

Gen KIBLER:

It is a question of the six-gun battery now. It appears to be the consensus of this meeting that we should have it. Is there anybody who dissents from that view?

(No dissent.)

Gen KIBLER:

Our next question is in relation to anti-aircraft artillery. Do you prefer one battalion assigned or a regiment of two battalions?

Col BAILEY:

The study of anti-aircraft artillery for the future might be called wandering into a realm of fantasy. We have types of weapons which the enemy used in this war that more or less portend the trend of the future. There are going to be supersonic missiles of all types like the V-1 and V-2. We had occasion to visit the British experimental station where they are experimenting with captured V-2's, and they are very enthusiastic about the future of them. An increase in their accuracy and the damage that can be inflicted can be expected. We have reason to believe that the V-1 type of pilotless aircraft (PAC) will be used extensively in range and their effectiveness will be increased. They will be used as much against front-line troops as they were in rear areas. Jet-propelled planes were developed to quite a high level at the close of the war to a speed of 600 miles per hour, but speeds have increased since then. They will be increased to as much as 1,000 miles per hour. Our studies show that we do have to take this into consideration. The V-2 went at a speed of 3,000 miles per hour. We have no weapon that can combat it. Lots of our weapons in the future still have to be developed. Another thing that bears on this picture is radar. Radar was developed for 75mm guns. In October of last year, they had small radar which was used with smaller caliber automatic weapons. The 75mm gun, we feel, is the one type of weapon to replace the 40mm gun. The English found it very effective, and we made good use of it in this war. It is the largest weapon that can use a posit fuze. The radar, however, did have some deficiencies. They are developing infra-red detecting instruments which will replace radar eventually. It will eliminate many of the things that we have found wrong with radar.

I think that we have to temper the conclusions that we make from this war with caution for the simple reason that the Germans had 1700 planes and the Allies 11,300 on D-Day. It was a seven to one superiority in the air. The conclusions we draw from this war are not the ones that we should use because we must expect to go against an enemy in the next war who will have parity in the air. The anti-aircraft with all of the numerous types of weapons we have had has made us the jack of all trades and the master of not too many. We have come out trying to standardize our equipment and weapons and trying to eliminate some of them.

Col BAILEY (CONTD):

This is what we have evolved, two types of regiments: (one) a regiment of two battalions of 90mm guns, mobile; (two) a regiment of two battalions of automatic weapons, four batteries each. Type of weapon: in an automatic regiment, we will have a 75mm automatic cannon or a full-track low armored vehicle, self-propelled. We will have a quad-mount 20mm gun to replace the present 50mm gun. We will have two battalions of four batteries each and in each battalion, 32 full-track self-propelled armored 75's. In the present automatic weapons battalion, there are 32-40's and 32 quad-mounts, either towed or half-tracks. They were cut down before the Normandy invasion by 16. Our regiment will have 64-75's (SP) and 64-20mm quad-mounts. During the Battle of the Bulge, they did not have enough anti-aircraft and had to call back to Com Z for more. Some that came up were semi-mobile. We feel all our weapons should be useful in any sort of an emergency. Another thing, gentlemen, I would like to point out the fact that when an infantry division has had rough action for a while, it must have a rest and moves to a rear area. They did in the Ninth Army. The anti-aircraft provided protection for them when they were there and there was no rest at all for the anti-aircraft gunners. If enemy air action were stronger the people up front would have cracked. Field artillery will have another battalion and we must protect the artillery. If we are to have four batteries of anti-aircraft to five battalions of field artillery, how can we do it?

Gen PATTON:

Self-propelled armored guns do not need anti-aircraft protection. The self-propelled gun removes the necessity of covering it.

Col BAILEY:

The regiment we hope to have in the infantry division has approximately 1400 men. I want to impress on you the tremendous fire power this unit would have. All of you in divisions certainly made use of anti-aircraft for ground missions.

Gen KIBLER:

The committee felt that we really had not clearly established requirements for anti-aircraft in this theater, owing to the small scale of air opposition. We did inherit experience from the Mediterranean Theater where there was air opposition and one battalion per division was about what seemed to be required there. Such demands for additional anti-aircraft in the European Theater of Operations as existed may have been influenced by lack of field artillery ammunition. The committee realizes that planes will fly faster and faster but felt that improvement in anti-aircraft might keep pace with this. Would you prefer a regiment of two battalions? Those in favor of a regiment raise your hand.

(None favored it.)

Gen KIBLER:

Do you agree with the organic assignment of an engineer regiment of two battalions to the division?

Gen KEYES:

I don't see any reason for it. It's just a case of taking engineers and assigning them organically to the regiment.

Col HEINTGES:

Engineers should be specialists. We don't want them up front; there will be too many casualties.

Gen KIBLER:

Does anybody want engineers organic in the infantry regiment?

(None favored it.)

Gen McBRIDE:

I didn't find a great deficiency of engineers. I would like to see a battalion of four companies instead of three working companies so that I could have an extra company when running into roads where there is mining or demolition to be done. I didn't object to corps engineers working in my area. I had a lot of engineer work but we did not use the prisoner of war labor that was available.

Gen DAVIDSON:

The engineers were placed in support of division, not attached. When we put a company of engineers with each regimental combat team, we got little engineer work out of them. The division engineers lost flexibility because of their spread among the three regimental combat teams.

Gen KEYES:

You need the engineers and you don't have enough of them. With all this extra armor, etc., you will have to augment the one battalion of engineers. I personally think we need more engineers than we have now.

Gen McBRIDE:

I prefer to give the engineers to army and attach them when necessary.

Col McGARR:

The necessity of engineers varies with the terrain.

Gen McBRIDE:

I would like to see four companies in one battalion.

Gen GAY:

Experience proves that we need three engineer battalions for each division. Our question then is whether two of those battalions should be in division and one in the corps, or one in the division and two in the corps.

Gen KIBLER:

Are there any other views? I will ask you to indicate if you are in favor of the two-battalion regiment.

(The majority voted in favor.)

Gen KIBLER:

Will the incorporation of a tank regiment and engineer regiment result in a proper balance with respect to the infantry strength of the infantry division? In other words, have we put in any elements out of proportion to the infantry strength?

Gen ROBERTSON:

You certainly have. What you want is infantry in depth which this organization does not provide.

Gen McBRIDE:

It only gives you width if you add more infantry.

Gen ROBERTSON:

During the war we had to put replacements into the line immediately. What we should have done with these men was to keep them in a reinforcement battalion. You have got to have somewhere behind you some men who are trained and ready to step up as platoon leaders.

Col McGARR:

I would like one behind my regiment to use for what it is meant to be used for - replacement.

Gen ROBERTSON:

If you put that reinforcement (replacement) battalion behind each regiment you will not have a combat battalion.

Gen PATTON:

You don't have to limit the size of the replacement battalion we have shown in the proposed infantry division. The replacements come in there and the returnees go in there too.

Gen ROBERTSON:

And your battle exhaustion cases go in there. It is a fact that front-line units fought under-strength. We must do something about that. You can't expect the infantry to carry on sustained action day after day, week after week, under any such organization like that.

Gen ALLEN:

Of course, there was a general shortage of replacements in this war. No matter how many replacement battalions you might have had there were not enough men to put in them.

Gen ROBERTSON:

You have got to have some system in your organization to let you integrate the men into your organization. It is fundamentally wrong to replace men on the front lines. It is unfair.

Gen PATTON:

It's murder.

(At this point there was some discussion of the possibility of providing a fourth platoon in each rifle company.)

Gen KIBLER:

I would like to determine who is in favor of one reinforcement battalion in a division as we have it. Please indicate by raising your hand.

(Majority was in favor.)

Gen KIBLER:

Who prefers four platoons in a rifle company?

(None in favor.)

Gen KIBLER:

The meeting is now open for any other discussion.

Col BIDDLE:

I invite further consideration of the cavalry element of the division. This troop (pointing to chart) is a great improvement over the former troop. In the first place, the platoon is stronger and has within it a small rifle element ready to fight on the

Col BIDDLE (CONTD):

ground. There are four of these platoons. Finally, the whole troop is commanded by a major. The reason is that a captain, we found, does not have enough rank and prestige to make his opinions felt. In addition that troop was definitely ineffective in combat. In some cases it was reinforced and made into a task force. This organization was proposed by a sub-committee working on mechanized cavalry. It was the consensus that a squadron was not wanted, but that a stronger troop was wanted; however, there is some minority who feels there should be a squadron. The squadron we recommend has three cavalry troops as in my chart without the extra platoons and without these supporting platoons. (Explains chart and calls Colonel Macdonald, a troop commander.)

Col MACDONALD:

I feel very strongly that the present reconnaissance troop was not able to perform the missions to which it was assigned. We had to reinforce them. They just did not have the fighting power to do those jobs. With troops of that kind and only a captain in command, we were not able to build up men with experience enough in cavalry to provide men with tactical ability to do the job. I recommend a squadron with a lieutenant colonel commanding. I don't think that a cavalry squadron is too large. The present organization, I think, is nothing but a compromise. You have not increased the fighting strength of the troop, but as the chart shows, just added a little.

Gen KIBLER:

Is there any further discussion?

Gen McBRIDE:

I go for extra cavalry instead of the other things we have added. We need more cavalry reconnaissance.

Gen KIBLER:

What would a squadron consist of?

Col BIDDLE:

(Colonel Biddle here explains the chart.) This is a squadron within a regiment. It does not have a service element which would be added to headquarters. There will be three cavalry troops, divided into three cavalry platoons. Also a rifle troop organized into three rifle platoons and a mortar platoon. (Colonel Biddle produces another chart showing the cavalry platoon and explains it.)

Gen ROBERTSON:

How about taking the reconnaissance element from the division and putting it in the corps? We must either have men in the division or none at all. Consideration should be given to having a group in the corps and putting them in front of the division when the situation arises.

Gen McBRIDE:

I disagree with the premise that you only need them when the situation arises.

Gen ROBERTSON:

If you can reach back in corps and pull out a squadron and group, isn't this one type unit that you can call for when needed and not have all the time? I would rather have nothing than just a troop because it isn't enough to do the job.

Gen GAY:

Let's ask Macdonald about that.

Col MACDONALD:

From the time I took command of a group until the end of the war, there was never a minute when my squadron was not in use by the corps. The group I had was never a normal cavalry group. The demand for cavalry squadrons was never met. I think we need them all the time.

Gen PATTON:

I would like to ask three questions which are off the subject: first, has anybody ever seen a gun sling used for shooting in action? We can save much money and leather if we don't make the sling. Second, has anyone ever seen a sight set in combat? I have asked a number of officers and they have never seen a sight set. We make an instrument that nobody uses. Third, we did a great deal of night fighting and fighting in early morning and snow - is the peepsight the proper sight for that kind of fighting?

(Some discussion followed.)

Gen ROBERTSON:

We must teach a man the possibilities of a weapon and give him confidence in it.

Gen PATTON:

I see no sense in sights beyond 300 yards. Is there objection to having all weapons which shoot projectiles-mortars, cannons, etc. - use the same nomenclature and system of laying?

Gen McBRIDE:

There's not only no objection but it's important.

Gen KIBLER:

To come back to the subject, I believe you feel that there should be a cavalry squadron in the division, as on the chart. Anybody dissent?

(No dissents)

Any other points to discuss?

Gen McBRIDE:

How about radar companies and anti-mortar people?

Gen BALMER:

Anti-aircraft artillery have most of the radar. Place radar detection in the division and not in the corps.

(No further discussion.)

Gen PATTON:

I would like to thank both the visiting officers and members of The Board for the remarkable intelligence shown. Also for the very hard work which has been put into the study and I wish to reiterate that this study is not a result of The Board, but the result of a large number of people mentioned on these pages. It goes down to including captains and majors.

The conference adjourned at 1600.